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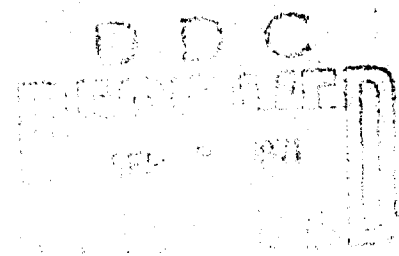
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APO San Francisco 96384

**FINAL REPORT**

**OPTIMUM MIX OF ARMORED VEHICLES FOR USE**

**IN STABILITY OPERATIONS**

**ACTIV Project No. ACG 69F**

**VOLUME TWO OF THREE VOLUMES**

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report

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# TABLE OF CONTENTS

VOLUME ONE - SUMMARY VOLUME	PAGE
ACKNOWLEDGEMENTS	i
ABSTRACT	iii
INDEX OF FIGURES (VOLUME I)	vii
SECTION I - INTRODUCTION	I-1
SECTION II - OPERATIONAL PROFILE - ARMOR IN RVN	II-1
SECTION III - FINDINGS AND ANALYSIS	III-1
SECTION IV - CONCLUSIONS AND RECOMMENDATIONS	IV-1
ANNEX A - GLOSSARY	A-1
ANNEX B - ORGANIZATIONAL AND EQUIPMENT MODIFICATIONS	B-1
ANNEX C - STATUS OF EQUIPMENT	C-1
ANNEX D - MACOV CORRELATION	D-1
VOLUME TWO - UNIT CONSIDERATIONS	
INDEX OF FIGURES (VOLUME II)	iv
ANNEX E - UNIT DESIGNATIONS AND LOCATIONS	E-1
ANNEX F - SUMMARY OF UNIT ACTIVITIES	F-1
Appendix 1 - 11th ARMORED CAVALRY REGIMENT	F-3
TAB A - 1st Squadron, 11th Cavalry	F-4
TAB B - 2d Squadron, 11th Cavalry	F-6
TAB C - 3d Squadron, 11th Cavalry	F-8
Appendix 2 - ARMORED CAVALRY SQUADRON, DIVISIONAL	F-10
TAB A - 1st Squadron, 1st Cavalry	F-11
TAB B - 2d Squadron, 1st Cavalry	F-13
TAB C - 1st Squadron, 4th Cavalry	F-15
TAB D - 3d Squadron, 4th Cavalry	F-17
TAB E - 3d Squadron, 5th Cavalry	F-19

	<u>PAGE</u>
Appendix 3 - SEPARATE ARMORED CAVALRY TROOPS	F-21
TAB A - E Troop, 1st Cavalry	F-22
TAB B - D Troop, 17th Cavalry	F-24
TAB C - E Troop, 17th Cavalry	F-26
TAB D - F Troop, 17th Cavalry	F-28
Appendix 4 - TANK BATTALIONS	F-30
TAB A - 2d Battalion, 34th Armor	F-31
TAB B - 1st Battalion, 69th Armor	F-33
TAB C - 1st Battalion, 77th Armor	F-35
Appendix 5 - MECHANIZED INFANTRY BATTALIONS	F-37
TAB A - 2d Battalion, 2d Infantry	F-38
TAB B - 1st Battalion, 5th Infantry	F-40
TAB C - 1st Battalion, 16th Infantry	F-42
TAB D - 2d Battalion, 22d Infantry	F-44
TAB E - 4th Battalion, 23d Infantry	F-46
TAB F - 2d Battalion, 47th Infantry	F-48
TAB G - 1st Battalion, 50th Infantry	F-50
TAB H - 1st Battalion, 61st Infantry	F-52
ANNEX G - ARMORED CAVALRY REGIMENT	G-1
1. Employment	G-1
2. Organization	G-12
3. Quantitative Equipment Problems	G-31
ANNEX H - DIVISIONAL ARMORED CAVALRY SQUADRONS	H-1
1. Employment	H-1
2. Organization	H-9
3. Quantitative Equipment Problems	H-22
ANNEX I - SEPARATE ARMORED CAVALRY TROOPS	I-1
1. Employment	I-1
2. Organization	I-6
3. Quantitative Equipment Problems	I-15
ANNEX J - TANK BATTALIONS	J-1
1. Employment	J-1
2. Organization	J-9
3. Quantitative Equipment Problems	J-31
ANNEX K - MECHANIZED INFANTRY BATTALIONS	K-1
1. Employment	K-1
2. Organization	K-70
3. Quantitative Equipment Problems	K-80

	<u>Page</u>
ANNEX L - AUSTRALIAN ARMORED FORCES IN VIETNAM	L-1
1. Introduction	L-1
2. Organization	L-1
3. Operations	L-8
4. Logistics Support	L-11
ANNEX M - SUMMARY OF RECOMMENDATIONS	M-1

### VOLUME THREE - MATERIEL AND COMMUNICATIONS

INDEX OF FIGURES (VOLUME III)	iii
ANNEX N - MATERIEL PROBLEM AREAS	N-1
ANNEX O - LOCAL EQUIPMENT MODIFICATIONS	O-1
ANNEX P - COMMUNICATIONS	P-1
ANNEX Q - DISTRIBUTION	Q-1

# INDEX OF FIGURES

<u>Figure</u>	<u>Page</u>
E-1 Distribution of Armored/Mechanized Units by Corps Tactical Zone	E-3
F-1 Unit Locations - 11th Armored Cavalry Regiment	F-3
F-2 Area of Operations - 1st Squadron, 11th Armored Cavalry Regiment	F-5
F-3 Area of Operations - 2d Squadron, 11th Armored Cavalry Regiment	F-7
F-4 Area of Operations - 3d Squadron, 11th Armored Cavalry Regiment	F-9
F-5 Unit Locations - Armored Cavalry Squadrons, Divisional	F-10
F-6 Area of Operations - 1st Squadron, 1st Cavalry	F-12
F-7 Area of Operations - 2d Squadron, 1st Cavalry	F-14
F-8 Area of Operations - 1st Squadron, 4th Cavalry	F-16
F-9 Area of Operations - 3d Squadron, 4th Cavalry	F-18
F-10 Area of Operations - 3d Squadron, 5th Cavalry	F-20
F-11 Unit Locations - Separate Armored Cavalry Troops	F-21
F-12 Area of Operations - E Troop, 1st Squadron, 1st Cavalry	F-23
F-13 Area of Operations - D Troop, 17th Cavalry	F-25
F-14 Area of Operations - E Troop, 17th Cavalry	F-27
F-15 Area of Operations - F Troop, 17th Cavalry	F-29
F-16 Unit Locations - Tank Battalions	F-30
F-17 Area of Operations - 2d Battalion, 34th Armor	F-32
F-18 Area of Operations - 1st Battalion, 69th Armor	F-34
F-19 Area of Operations - 1st Battalion, 77th Armor	F-36
F-20 Unit Locations - Mechanized Infantry Battalions	F-37
F-21 Area of Operations - 2d Battalion, 2d Infantry	F-39
F-22 Area of Operations - 1st Battalion, 5th Infantry	F-41
F-23 Area of Operations - 1st Battalion, 16th Infantry	F-43
F-24 Area of Operations - 2d Battalion, 22d Infantry	F-45
F-25 Area of Operations - 4th Battalion, 23d Infantry	F-47
F-26 Area of Operations - 2d Battalion, 47th Infantry	F-49
F-27 Area of Operations - 1st Battalion, 50th Infantry	F-51
F-28 Area of Operations - 1st Battalion, 61st Infantry	F-53
G-1 Location of 11th ACR Elements During Evaluation	G-2
G-2 Average Combat Power Committed to Each Type of Mission, ACR	G-3
G-3 Organizational Chart, 11th ACR	G-4
G-4 Average Available Combat Power for the 11th ACR During the Evaluation Period	G-5
G-5 Standard Cavalry Troop Column Formations	G-6
G-6 Type Cavalry Troop Box Formations	G-7
G-7 Type Cavalry Platoon Formations	G-8
G-8 Cavalry Platoon Minesweep Formations	G-10
G-9 Strong Point Formations	G-11
G-10 Administrative and Support Organization, 11th ACR	G-14
G-11 Radar Equipment Authorized and On-Hand	G-20
G-12 Location and Control of Radars	G-20
G-13 Recovery of Mired AVLB	G-21

<u>Figure</u>		<u>Page</u>
G-14	Use of 500-Gallon Drum on M113A1 Carrier for POL Resupply	G-23
G-15	Actual Employment of HHT M113A1 and M132A1 Vehicles, Armored Cavalry Squadron, ACR	G-26
G-16	Scout ACAVs Supporting Dismounted Crewmen by Fire	G-28
G-17	Track-Mounted Mine Roller (ENSURE 202)	G-34
G-18	Chain Link Fence Employed for RPG Protection	G-35
G-19	AN/VSS-3 Searchlight Mounted on M551 AR/AAV	G-36
G-20	M551 AR/AAV Dual Caliber .50 Machineguns	G-38
G-21	FM Radio Equipment Authorized/Utilized by Regimental HHT	G-40
G-22	Rectifier Providing Charge to DC Batteries	G-42
G-23	Accumulation of Sludge in M113A1 Engine Compartment	G-45
H-1	Location of Divisional Armored Cavalry Squadrons During the Evaluation	H-2
H-2	Average Combat Power Committed to Each Type of Mission	H-3
H-3	Organizational Chart, Divisional Armored Cavalry Squadron (Less Air Cavalry Troop)	H-4
H-4	Average Available Combat Power, Divisional Armored Cavalry Squadron	H-5
H-5	Armored Cavalry Troop NDP	H-6
H-6	Actual Employment of HHT M113A1 and M132A1 Vehicles, Divisional Armored Cavalry Squadrons	H-13
H-7	Radar Equipment Authorized/On Hand, Divisional Armored Cavalry Squadrons	H-14
H-8	Radar Control, Employment, and Movement, Divisional Armored Cavalry Squadrons	H-14
H-9	Resupply Operations, Divisional Armored Cavalry Squadron	H-16
H-10	Air Resupply of Divisional Armored Cavalry Squadron	H-17
H-11	Armored Cavalry Platoon in Action	H-21
H-12	Secure Equipment On Hand in Divisional Armored Cavalry Squadrons	H-26
I-1	Location of Separate Armored Cavalry Troops During Evaluation	I-2
I-2	Average Combat Power Committed to Each Type of Mission, Separate Armored Cavalry Troops	I-3
I-3	Average Available Combat Power, Separate Armored Cavalry Troops	I-4
I-4	Separate Armored Cavalry Troop Reconnaissance Operations	I-5
I-5	Radar Equipment Authorized and On Hand	I-8
I-6	Radar Control, Employment and Method of Movement	I-9
I-7	Resupply Operations, Separate Armored Cavalry Troops	I-11
I-8	Air Resupply to Separate Armored Cavalry Troop	I-12
I-9	M551 AR/AAVs Employed with M113A1 APC/ACAVs in Armored Cavalry Platoon	I-14
J-1	Location of Tank Elements During the Evaluation	J-2
J-2	Average Combat Power Committed to Each Type of Mission, Tank Battalions	J-2
J-3	Average Available Combat Power For Tank Battalions	J-4
J-4	Night Movement Conducted by Armored Battalion Elements During Evaluation	J-5
J-5	Organization of the Tank Battalion	J-11

FigurePage

J-6	MTOE Organization of HHC, Tank Battalion	J-15
J-7	MTOE Organization of Service Company, Tank Battalion	J-16
J-8	Scout Platoon M113A1 APC/ACAVs on Sweep Operation	J-18
J-9	4.2-Inch Mortar Firing Position on NDP Perimeter	J-20
J-10	Radar Equipment Authorized and On Hand in the Tank Battalions	J-21
J-11	Normal Radar Employment in the Tank Battalions	J-21
J-12	FSB Refueling Point	J-23
J-13	AVLB Section of the Tank Battalion	J-26
J-14	Use of 600-Gallon Tanks for Water Storage at FSB Mess	J-34
J-15	Tank-Mounted Mine Roller, ENSURE 202	J-35
J-16	Tank-Mounted 23-Inch Xenon Searchlight.	J-37
J-17	Utilization of FM Radio Equipment in the Tank Battalion HHCs	J-39
J-18	Stated Requirements for Secure Equipment in the Tank Battalions	J-41
K-1	Location of Mechanized Infantry Battalions During the Evaluation	K-2
K-2	Average Combat Power Committed to Types of Missions	K-3
K-3	Average Available Combat Power, Mechanized Infantry Battalions	K-4
K-4	Mechanized Rifle Company Show of Force	K-7
K-5	Typical Mechanized Infantry Company Mounted Reconnaissance Patterns in Jungle	K-8
K-6	Typical Mechanized Infantry Company/Platoon Mounted Recon- naissance and Dismounted Search Routes	K-10
K-7	Typical Mechanized Rifle Company NDP	K-13
K-8	Typical Mechanical Ambush	K-15
K-9	Typical Mechanized Rifle Company Night Ambush Operation in Populated Area	K-16
K-10	Mechanized Rifle Platoon Combined Operation	K-18
K-11	Organization of the Mechanized Infantry Battalion	K-21
K-12	Mechanized Infantry Battalion Staff and Support Elements Dispersion	K-24
K-13	Personnel and Equipment Provided to the S5 in the Mechanized Infantry Battalion	K-25
K-14	MTOE Organization of HHC, Mechanized Infantry Battalion	K-27
K-15	MTOE Organization of Service Company, Mechanized Infantry Battalion	K-28
K-16	Scout Platoon Employment, Mechanized Infantry Battalion	K-30
K-17	Heavy Mortar Platoon Ammunition Trailer.	K-32
K-18	Flame Equipment Authorized and On Hand in Mechanized Infantry Battalions	K-33
K-19	The Marginal Terrain Assault Bridge	K-34
K-20	Radars Authorized and On Hand in Mechanized Infantry Battalions	K-35
K-21	Control of Employment of Radars in Mechanized Infantry Battalions	K-36
K-22	Resupply Operations, Mechanized Infantry Battalions	K-39
K-23	Tank and Pump Unit Mounted on M548 Tracked Cargo Carrier	K-40
K-24	Mechanized Rifle Squad	K-45
K-25	Average Strength of Mechanized Rifle Platoons and Squads During the Evaluation	K-46
K-26	M113A1 APC/ACAV Supporting Dismounted Infantrymen	K-47

<u>Figure</u>	<u>Page</u>
K-27 M125A1 Mortar Carrier Employed on NDP Perimeter	K-49
K-28 Cargo Vehicles and Water Trailers Authorized and On Hand/ Recommended by Battalions	K-52
K-29 Mine Damage to M113A1 APC/ACAV	K-54
K-30 Steel Planking Used to Provide RPG Standoff Protection	K-55
K-31 Passive Night Vision Devices On Hand in the Mechanized Infantry Battalions	K-56
K-32 Utilization of FM Radio Equipment in Mechanized Infantry Battalion MHCs	K-60
K-34 Proposed Location of Secure Equipment	K-61
K-35 AB-577 Antenna Base	K-65
L-1 Tank Squadron Organization, Royal Australian Task Force - Vietnam	L-2
L-2 Centurion MK-V Tank	L-3
L-3 Cavalry Squadron Organization, Royal Australian Task Force - Vietnam	L-5
L-4 Cavalry Troop Organization	L-6
L-5 Cavalry Support Troop Organization, Royal Australian Task Force - Vietnam	L-7
L-6 M113A1 Trackwell Armor	L-11
L-7 Fitters' Vehicle Crane	L-12
M-1 Total Resource Change Requirements by Type of Unit	M-1
M-2 Recommendations Pertaining to Intelligence	M-5
M-3 Recommendations Pertaining to Mobility	M-6
M-4 Recommendations Pertaining to Firepower	M-7
M-5 Recommendations Pertaining to Command and Control	M-9
M-6 Recommendations Pertaining to Support	M-10



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## ANNEX E

### UNIT DESIGNATIONS AND LOCATIONS

1. (C) Unit Designations by Type, Parent Organization, and Corps Tactical Zone (CTZ)

a. <u>Armored Cavalry Regiment</u> (1)	<u>CTZ</u>
11th Armored Cavalry Regiment	III
b. <u>Tank Battalion</u> (3)	
2/34 (25th Infantry Division)	III
1/69 (4th Infantry Division)	II
1/77 (1st Brigade, 5th Mechanized Division)	I
c. <u>Armored Cavalry Squadron, Divisional</u> (6)	
1/1 (23d Infantry Division)	I
2/1 (I Field Force, Vietnam)	II
1/4 (1st Infantry Division)	III
3/4 (25th Infantry Division)	III
3/5 (9th Infantry Division)	I
1/10 (4th Infantry Division)	II
d. <u>Infantry Battalion (Mechanized)</u> (9)	
2/2 (1st Infantry Division)	III
1/5 (25th Infantry Division)	III
2/8 (4th Infantry Division)	II
1/16 (1st Infantry Division)	III
2/22 (25th Infantry Division)	III
4/23 (25th Infantry Division)	III
2/47 (9th Infantry Division)	III
1/50 (I Field Force, Vietnam)	II
1/61 (1st Brigade, 5th Mechanized Division)	I
e. <u>Separate Cavalry Troop</u> (6)	
E/1/1 (23d Infantry Division)	I
D/17 (199th Light Infantry Brigade)	III
E/17 (173d Airborne Brigade)	II
F/17 (23d Infantry Division)	I
H/17 (23d Infantry Division)	I
A/4/12 (1st Brigade, 5th Mechanized Division)	I

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## 2. (C) Units by CTZ and Parent Unit

### a. I CTZ

#### (1) 23d Infantry Division

1/1 Armored Cavalry Squadron  
E/1/1 Separate Cavalry Troop  
F/17 Separate Cavalry Troop  
H/17 Separate Cavalry Troop

#### (2) 1st Bde, 5th Mechanized

1/77 Tank Battalion  
1/61 Mechanized Infantry  
A/4/12 Separate Cavalry Troop  
3/5 Armored Cavalry Squadron (Attached)  
C/2/34 Tank Battalion (Attached)

### b. II CTZ

#### (1) 4th Infantry Division

1/69 Tank Battalion  
1/10 Armored Cavalry Squadron  
2/8 Mechanized Infantry Battalion

#### (2) 173d Airborne Brigade

E/17 Separate Cavalry Troop

#### (3) TF South (I Field Force, Vietnam)

2/1 Armored Cavalry Squadron  
1/50 Mechanized Infantry Battalion

### c. III CTZ

#### (1) 1st Infantry Division

1/4 Armored Cavalry Squadron  
2/2 Mechanized Infantry Battalion  
1/16 Mechanized Infantry Battalion  
B/2/34 Tank Battalion (Attached)

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(2) 25th Division

2/34 Tank Battalion (-)  
 3/4 Armored Cavalry Squadron  
 1/5 Mechanized Infantry Battalion  
 2/22 Mechanized Infantry Battalion  
 4/23 Mechanized Infantry Battalion

(3) 11th Armored Cavalry Regiment

(4) 3d Brigade, 9th Infantry Division

2/47 Mechanized Infantry Battalion

(5) 199th Light Infantry Brigade

D/17 Separate Cavalry Troop

3. (C) Recapitulation, Type Units by CTZ

TYPE UNIT	CTZ		
	I	II	III
Armored Cavalry Regiment	-	-	1
Tank Battalion	1+	1	1 (-)
Armored Cavalry Squadron, Divisional	2	2	2
Mechanized Infantry Battalion	1	2	6
Separate Cavalry Troop	4	1	1

FIGURE E-1 (C). Distribution of Armored/Mechanized Units  
 by Corps Tactical Zone (U).

## ANNEX F

### SUMMARY OF UNIT ACTIVITIES

#### 1. (U) INTRODUCTION

a. In the conduct of this study, ACTIV data collectors visited nearly all armored and mechanized units in RVN during the period 2 January to 10 April 1970. These visits lasted for an average of four days. The units were conducting a variety of operations in differing environments and against varying threats. This annex contains an operational and logistical summary of each unit's activity at the time it was visited. While each unit's operation was unique, these summaries, taken together, are representative of the type of operations conducted by armored units during the time period.

b. This annex is divided into five appendices, one for each type unit. The individual unit summaries are presented as tabs at the appropriate appendix. For completeness, all armor units in RVN are included; those units not evaluated are so indicated. The following list gives the order of presentation and dates the units were visited.

<u>UNIT</u>	<u>DATES VISITED</u>
<b>11th ARMORED CAVALRY REGIMENT</b>	
1st Squadron, 11th Cavalry	2 - 7 Jan 70
2d Squadron, 11th Cavalry	2 - 5 Feb 70
3d Squadron, 11th Cavalry	22 - 27 Jan 70
<b>ARMORED CAVALRY SQUADRONS, DIVISIONS</b>	
1st Squadron, 1st Cavalry (23rd Inf Div)	17 - 20 Mar 70
2d Squadron, 1st Cavalry (I Field Force, Vietnam)	1 - 4 Mar 70
1st Squadron, 4th Cavalry (1st Inf Div)	13 - 18 Jan 70
3d Squadron, 4th Cavalry (25th Inf Div)	21 - 24 Feb 70
3d Squadron, 5th Cavalry (1st Bde, 5th Inf Div [M])	9 - 13 Mar 70
1st Squadron, 10th Cavalry (4th Inf Div)	Not Visited
<b>SEPARATE ARMORED CAVALRY TROOPS</b>	
E Troop, 1st Cavalry (23rd Inf Div)	9 Apr 70
A Troop, 4th Cavalry (1st Bde, 5th Inf Div [M])	Discussed as part of 1/77th Tank Bn
D Troop, 17th Cavalry (100th Lt Inf Bde)	23 Apr 70
E Troop, 17th Cavalry (173d Abn Bde)	10 - 11 Apr 70
F Troop, 17th Cavalry (23rd Inf Div)	19 Mar 70
H Troop, 17th Cavalry (23rd Inf Div)	20 Mar 70 - Main- tenance standdown

UNITDATES VISITED

## TANK BATTALIONS

2d Battalion, 34th Armor (25th Inf Div)	31 Jan - 4 Feb 70
1st Battalion, 69th Armor (4th Inf Div)	2 - 7 Jan 70
1st Battalion, 77th Armor (1st Bde, 5th Inf Div [M])	7 - 14 Feb 70

## MECHANIZED INFANTRY BATTALIONS

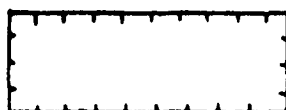
2d Battalion, 2d Infantry (1st Inf Div)	12 - 17 Jan 70
1st Battalion, 5th Infantry (25th Inf Div)	16 - 18 Mar 70
2d Battalion, 8th Infantry (4th Inf Div)	Not Visited
1st Battalion, 16th Infantry (1st Inf Div)	22 - 25 Jan 70
2d Battalion, 22d Infantry (25th Inf Div)	9 - 11 Mar 70
4th Battalion, 23d Infantry (25th Inf Div)	26 - 28 Feb 70
2d Battalion, 47th Infantry (9th Inf Div)	23 - 25 Mar 70
1st Battalion, 50th Infantry (I Field Force, Vietnam)	6 - 10 Apr 70
1st Battalion, 61st Infantry (1st Bde, 5th Inf Div [M])	30 Mar - 3 Apr 70

2. (U) MAP SYMBOLS

The nonstandard map symbols used in this annex are given below.



AO Boundary

Specified Fire Zone  
Time Limits (If Applicable)

1900-0600

No-Fire Zone  
Time Limits (If Applicable)

0600-1900



NDP/CP/FWD Base



Small Fixed Security Point



Fire Support Base



Base Camp

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## Appendix 1 (11th Armored Cavalry Regiment) to Annex F

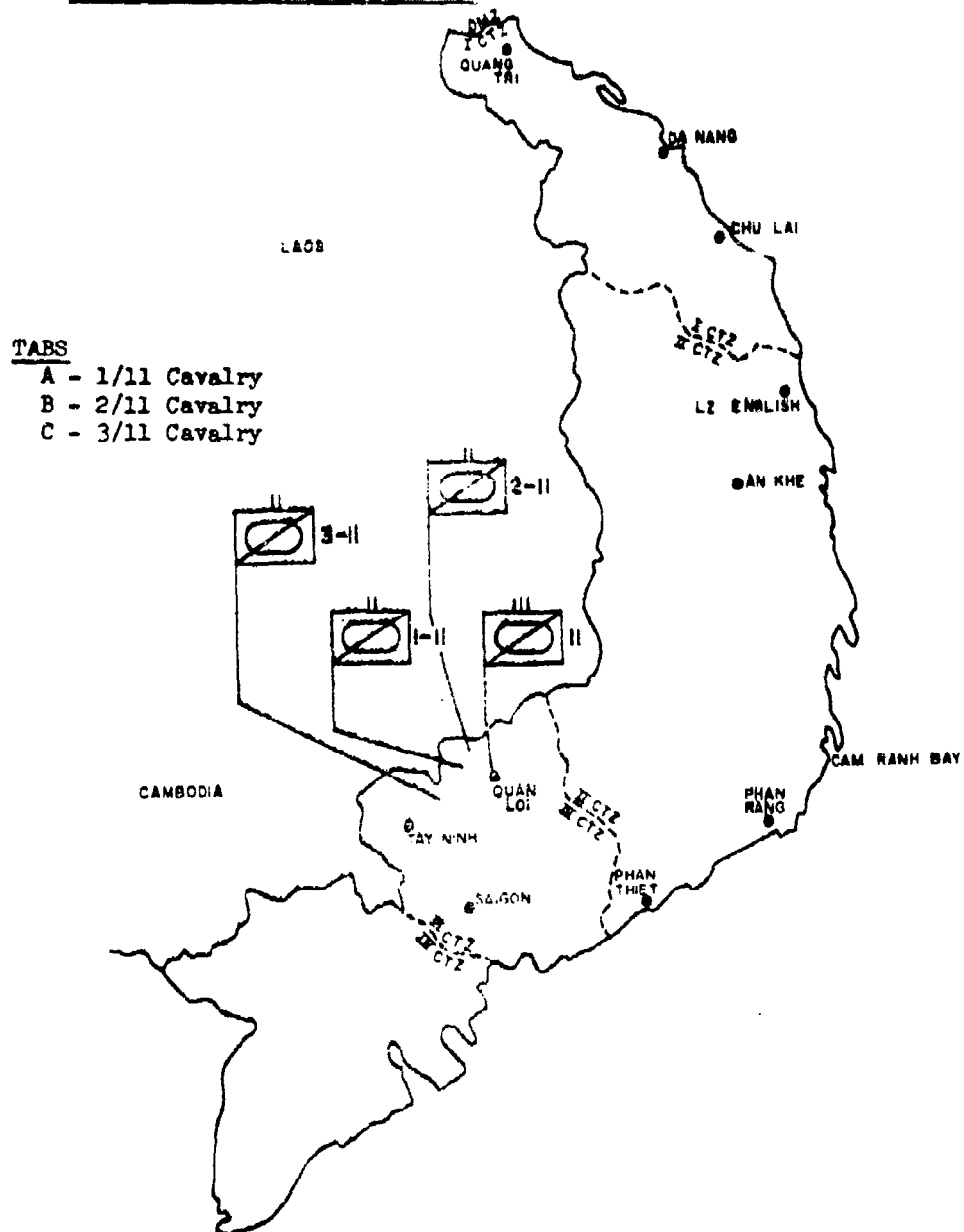


FIGURE F-1 (C). Unit Locations - 11th Armored Cavalry Regiment. (U)

F-3

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Tab A (1st Squadron, 11th Cavalry) to Appendix 1 to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

- (1) To find and destroy all VC/NVA units and installations in the AO.
- (2) To deny the enemy access to the Loc Ninh area.
- (3) To sweep QL-13 daily from Loc Ninh south to the Cam Le bridge.
- (4) To conduct combined operations with RF, PF, and CIDG units and provide rifle marksmanship training.
- (5) To conduct a civic action program (primarily ICAP) within the AO.

### b. Concept of Operations

The squadron employed its cavalry troops for zone reconnaissance within the AO; conducted a daily mine sweep of QL-13 with one cavalry platoon or the attached armored engineer platoon; conducted combined operations with local GVN/VNAP forces; and periodically rotated troops back to Quan Loi for maintenance standdown. During the period, the tank company was attached to the 199th Light Infantry Brigade in the vicinity of Xuan Loc. The howitzer battery was collocated with the squadron CP at FSB Marge.

### c. Events

Activity within the squadron AO during the period 2 - 7 January was light with no significant enemy contact reported.

## 2. (C) LOGISTICAL ACTIVITIES

The squadron base was established at Quan Loi. Rations, POL, and ammunition were drawn from support units at that location. Other supplies were trucked or flown from Long Binh to Quan Loi. Supplies required for the field were assembled at the squadron helicopter pad, where the S4 riggers prepared loads for CH-47 helicopters to deliver to the troop locations. Resupply generally required two sorties per day for each troop. On the evening sortie, the prepared hot supper meal in marmite cans, uncooked rations for the following day's breakfast, and cooks were flown to each troop. After breakfast the following day, the cooks returned on the morning CH-47 sortie. Fuel and water bladders were backhauled as they became empty.

F-4

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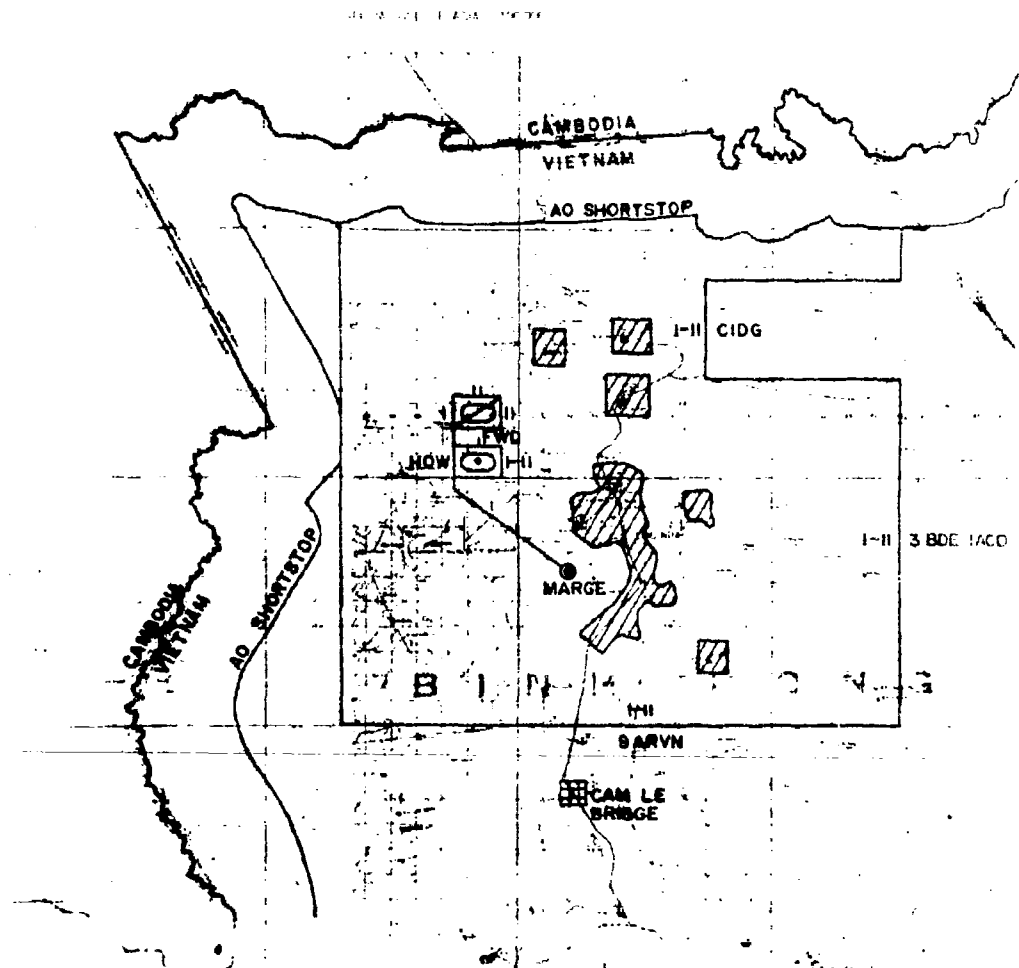


FIGURE F-2 (C). Area of Operations - 1st Squadron,  
11th Armored Cavalry Regiment. (U)

F-5

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Tab B (2d Squadron, 11th Cavalry) to Appendix to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

- (1) To find and destroy all VC/NVA units and installations in the AO.
- (2) To interdict enemy supply routes leading out from NVA Base Area 350.
- (3) To assist in upgrading the security of hamlets in the Loc Ninh area.
- (4) To conduct a daily mine sweep of QL-13 from Loc Ninh to the Cam Le bridge.
- (5) Be prepared to reinforce units in the Bu Dop and Quan Loi areas.
- (6) To conduct a civic action program (primarily ICAP) within the AO.

### b. Concept of Operations

The squadron conducted daylight zone reconnaissance with two cavalry troops and one attached rifle company; employed numerous night ambushes, primarily to secure the populated areas; retained the tank company as a reaction force; and swept QL-13 daily for mines with a cavalry platoon or the attached armored engineer platoon. The howitzer battery was collocated with the squadron CP. One cavalry troop was OPCON to the 3d Brigade, 1st Cavalry Division (Ambl).

### c. Events

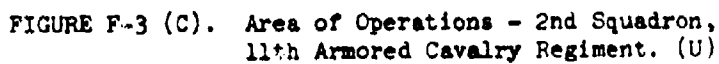
Activity within the squadron AO during the period 2 to 5 February was light with no significant activity reported.

## 2. (U) LOGISTICAL ACTIVITIES

Logistical activities were the same as those indicated for the 1st Squadron, 11th Cavalry (Tab A).

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F-7

# CONFIDENTIAL

Tab C (3d Squadron, 11th Cavalry) to Appendix 1 to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

- (1) To find and destroy all VC/NVA units in the AO.
- (2) To prevent enemy infiltration into An Loc.
- (3) To conduct combined operations with GVN forces under the Dong Tien program.
- (4) To sweep QL-13 for mines daily in-zone, and escort convoys as required.

### b. Concept of Operations

The squadron employed two troops to screen along the rubber plantations to the west and south of An Loc, to prevent VC/NVA infiltration, by conducting daylight mounted reconnaissance and establishing night strong points and ambushes; employed an attached infantry company to conduct reconnaissance operations to the north of An Loc, to detect and spoil enemy indirect fire attacks on An Loc and Quan Loi; employed one troop to secure FSBs Thunder III and IV, sweep QL-13 daily for mines, provide convoy escort, conduct limited local reconnaissance, establish night-ambush patrols and strong points along the route; and utilize HHT (-) and the howitzer battery to secure FSB Jan. One troop was OPCON to another unit during this period.

### c. Events

Activity during the period 22 to 27 January in the squadron AO was light. Significant incidents consisted of locating several mines implanted on roads within the AO and a mortar attack on the NDP of B/2/8 Infantry. All rounds fell outside of the perimeter. On 22 January, M Company found an unoccupied enemy base camp outside the rubber plantation, north of Lang Sau.

## 2. (U) LOGISTICAL ACTIVITIES

The platoon responsible for convoy escort refueled at Quan Loi. Other supplies were transported to the platoon's parent troop by road with the returning platoon. Platoons rotated convoy escort, enabling each platoon to refuel every third day. The attached infantry company was resupplied by road due to its close proximity to Quan Loi. Because of the close proximity of the howitzer battery to an airstrip, artillery ammunition was transported by fixed-wing aircraft. Resupply for the other troop and the tank company was accomplished by air, similar to that of the 1st Squadron, 11th Cavalry (Tab A).

F-8

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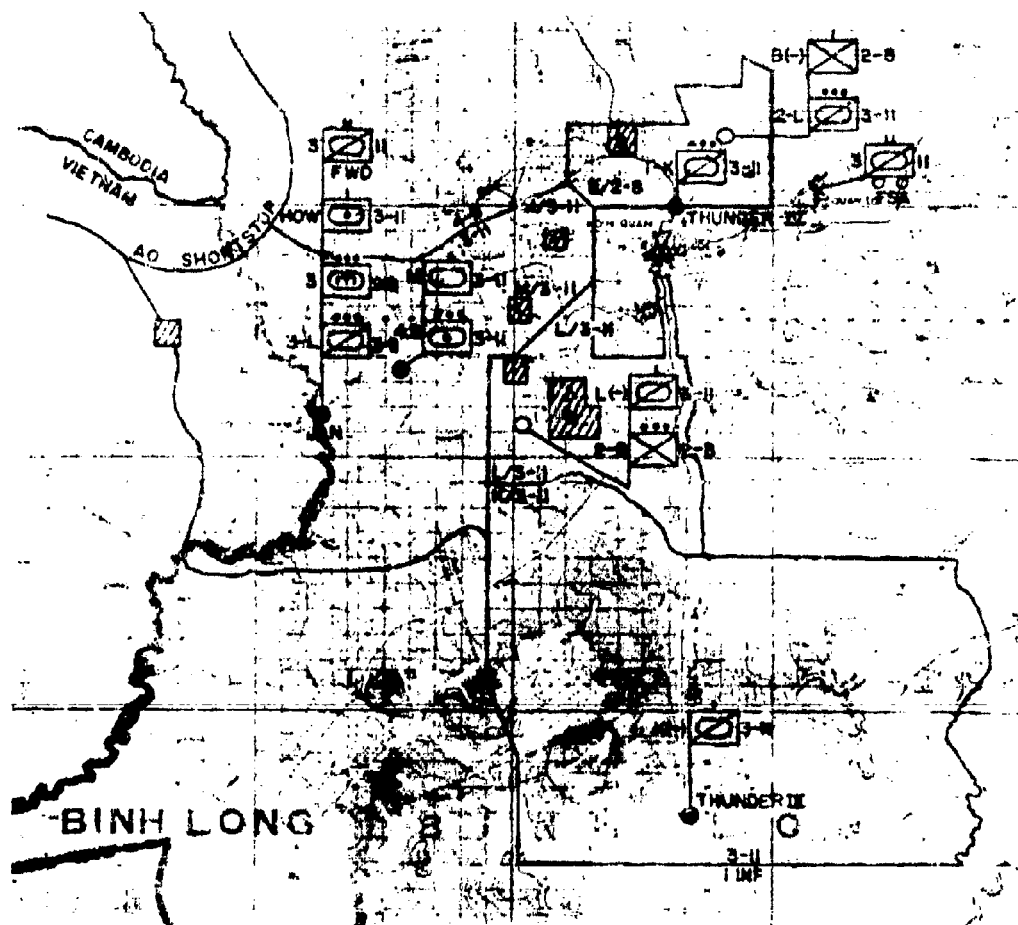


FIGURE F-4 (C). Area of Operations - 3rd Squadron,  
11th Armored Cavalry Regiment. (U)

F-9

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## Appendix 2 (Armored Cavalry Squadron, Divisional) to Annex F

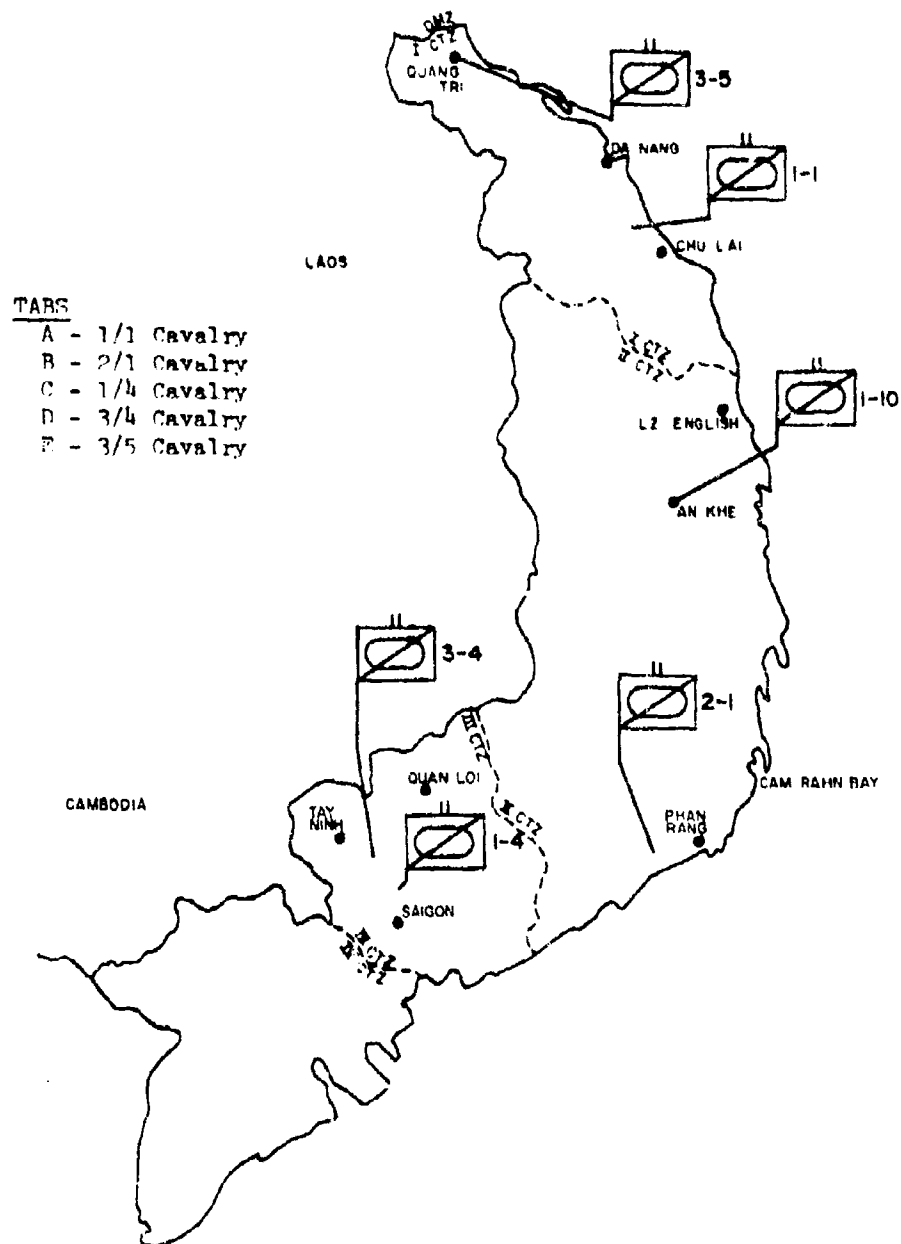


FIGURE F-5 (C). Unit Locations - Armored Cavalry Squadrons, Divisional. (U)

F-10

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Tab A (1st Squadron, 1st Cavalry) to Appendix 2 to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

- (1) To find and destroy all VC/NVA units and installations in the AO.
- (2) To operate a civic action program in the AO.

### b. Concept of Operation

(1) The 1/1 Cavalry was not assigned a permanent AO, but was assigned temporary AOs in areas of likely enemy contact anywhere within the 23th Inf Div TAOR.

(2) The squadron employed troop teams, cross-reinforced with attached infantry in assigned troop AOs, to conduct mounted zone reconnaissance. Special attention was given to detailed searches of "islands" (mounds rising above the paddies, 100-1000 meters in diameter) as these were the most likely enemy locations. At night, troop-sized NDPs were established. Activities were conducted in the eastern portion of the squadron AO. The air cavalry troop was detached.

### c. Events

During the period 17 - 20 March two groups of 8 - 10 enemy personnel were sighted, resulting in one VC KIA and the capture of three prisoners and a small amount of documents. One M113A1 APC/ACAV detonated a 500-pound bomb rigged as a mine, resulting in four US KIA and the loss of the APC.

## 2. (C) LOGISTICAL ACTIVITIES

Class I and III were drawn at the squadron base located at Hawk Hill. All other supplies were drawn at Chu Lai, the division base camp located 30 km to the south, and were transported to Hawk Hill on organic squadron vehicles. Line troops were resupplied with POL and ammunition from the FSA by CH-47 helicopter about every third day. Rations, water, and miscellaneous supplies were delivered daily by UH-1. When possible, the squadron rotated troops so that each could spend one night in the vicinity of Hawk Hill every third or fourth day. These units were resupplied overland.

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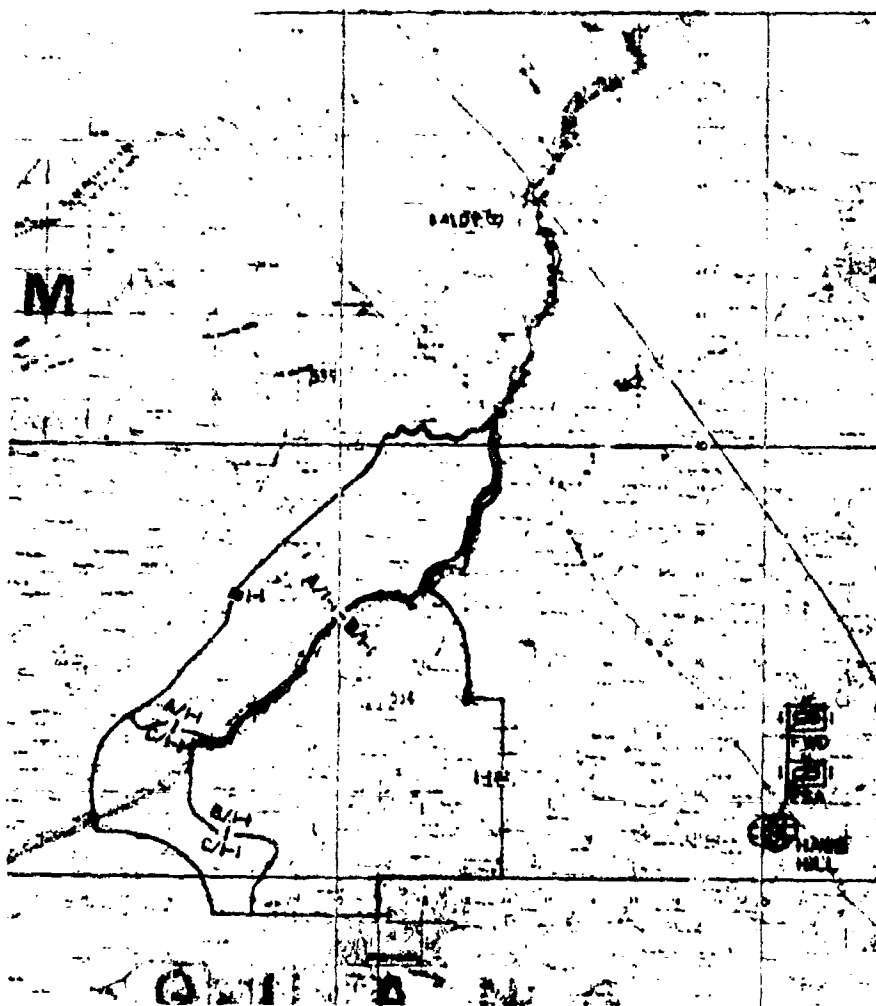


FIGURE F-6 (C). Area of Operations - 1st Squadron,  
1st Cavalry. (U)

F-12

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Tab B (2d Squadron, 1st Cavalry) to Appendix 2 to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

- (1) To secure QL-1 for civilian and military traffic in sector.
- (2) To find and destroy VC units and installations in Binh Thuan Province.
- (3) To conduct combined operations with GVN forces.
- (4) To secure FSBs in Binh Thuan Province.

### b. Concept of Operations

The squadron conducted route security and mounted reconnaissance operations in the vicinity of QL-1 with two troops, conducted search-and-clear operations in other parts of Binh Thuan Province with one troop, and provided platoons to secure the five FSBs and squadron headquarters at night. Combined operations were conducted with ARVN and RF/PF units along the 187-km section of QL-1 in the AO. The air cavalry troop was under the OPCON of Task Force South. As can be seen from the map, the squadron was widely dispersed throughout an exceptionally large AO.

### c. Events

Enemy activity during 1 - 4 March consisted of two mining incidents on QL-1. No casualties were reported.

## 2. (C) LOGISTICAL ACTIVITIES

The squadron was resupplied weekly by convoy from Cam Ranh Bay and Phan Rang. All classes of supplies, except Class I, were delivered to the squadron trains collocated with the CP at Song Mao. Rations were flown in from Phan Rang three times a week. The troops were resupplied on the average of every second day from Song Mao, either by air or by wheeled vehicle. The squadron had been tasked by Task Force South to provide Class I and III support for all US forces operating in northern Binh Thuan Province. This included one artillery battalion and one engineer battalion. Additionally, the squadron operated the fixed-wing airfield at Song Mao.

F-13

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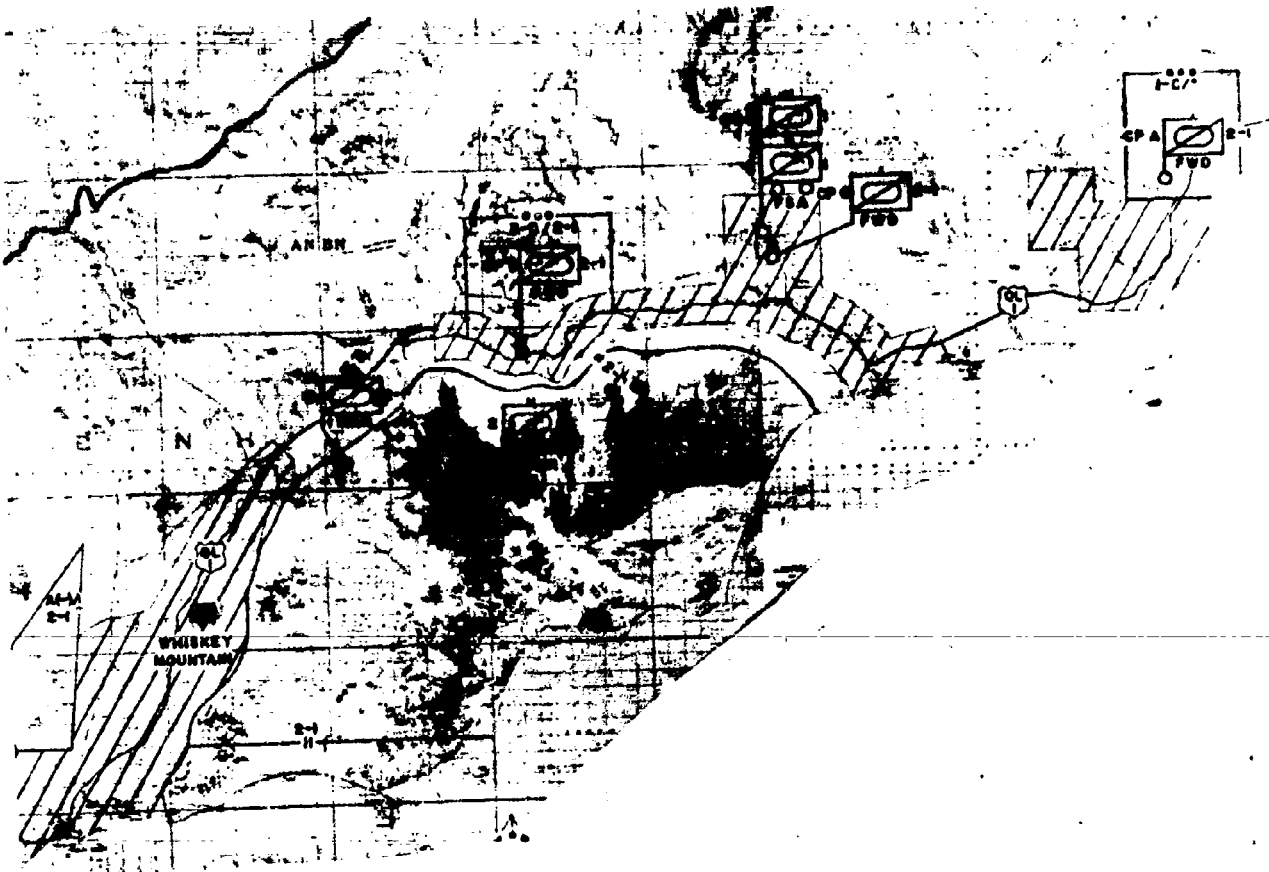


FIGURE F-7 (C). Area of Operations - 2nd Squadron,  
1st Cavalry. (U)

F-14

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Tab C (1st Squadron, 4th Cavalry) to Appendix 2 to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

(1) To find and destroy all VC/NVA units and installations in the AO and AO extension.

(2) To conduct combined operations with ARVN, RF, and PF forces.

### b. Concept of Operations

The squadron conducted mounted daylight reconnaissance operations and night mounted and dismounted ambushes. Two troops operated in the southern and western portion of the AO, while one troop conducted operations in the southern portion of the AO extension. Most operations were conducted by platoon-sized elements. During this period, there were no combined operations. The air cavalry troop was detached from squadron control.

### c. Events

Enemy activity during the period 13 - 18 January consisted of minor contacts near the Saigon River in the extreme southern portion of the squadron AO extension. Enemy encountered were believed to be members of the local VCI. On 14 January, one troop moved by road to Lai Khe, and conducted a scheduled standdown. On 15 January the troop in the AO extension moved into the southern sector of the AO.

## 2. (C) LOGISTICAL ACTIVITIES

The squadron established a FSA approximately 8 km northwest of Lai Khe. It was used to resupply line elements. Supplies were flown to the FSA, utilizing two CH-47 sorties a day. Normally every second day, each platoon went to the FSA to resupply and perform maintenance. The squadron CP was resupplied daily by road from Lai Khe, a distance of 9 km.

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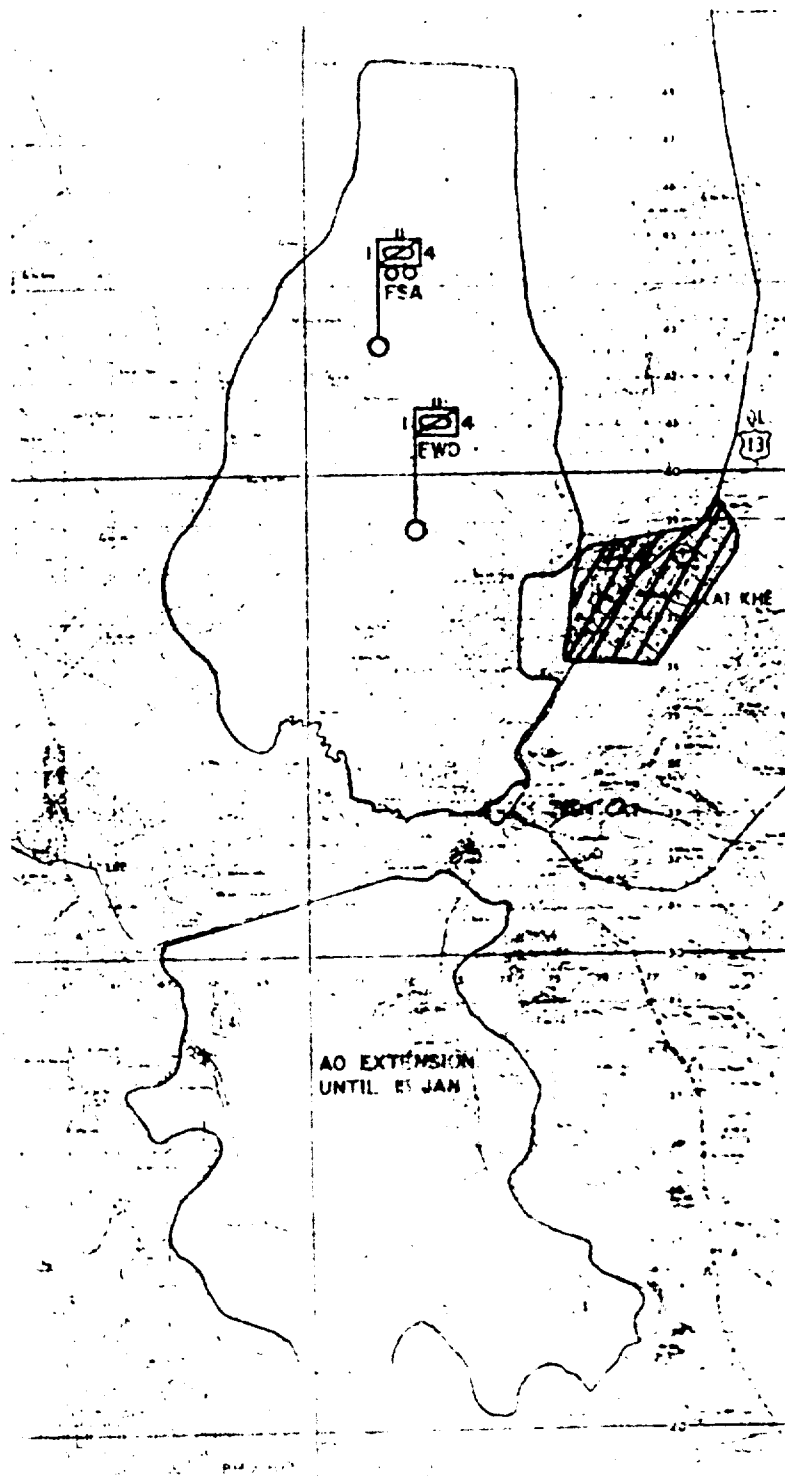


FIGURE F-8 (C). Area of Operations - 1st Squadron, 4th Cavalry. (U)

F-16

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Tab D (3d Squadron, 4th Cavalry) to Appendix 2 to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

- (1) To find and destroy all VC/NVA units and installations in the AO.
- (2) To conduct combined operations with ARVN, RF, and PF units under the Dong Tien program.
- (3) To secure land clearing operations adjacent to LTL-10.
- (4) To conduct a civic action program in the AO.
- (5) Be prepared for employment as the division reserve.

### b. Concept of Operations

The squadron employed two cavalry troops to conduct platoon-sized daylight mounted reconnaissance and night mounted and dismounted ambushes in the Boi Loi Woods, utilized one cavalry platoon to secure the land-clearing operation on LTL-19, and employed one troop at FSB Wood for FSB security and for combined operations with GVN forces. Cavalry troops were rotated periodically to Cu Chi, the squadron rear, for a maintenance standdown. Separate AOs were not assigned to the troops. The three troops were rotated throughout the squadron AO to familiarize the commanders with its entirety. The air cavalry troop was OPCON to division. Civic action/Dong Tien operations were conducted with RF and PF units in the southern portion of the AO. The goal was to encourage increased RF/PF patrolling activities by providing US cavalry reinforcements whenever required. The squadron worked in close coordination with 1/10th ARVN Cavalry in the adjacent AO to the south. As training progressed, and ARVN elements became more effective, it assumed responsibility for progressively longer sections of the 3/4 Cavalry AO. The squadron civic action project, called CAVCAP, consisted of assisting local ARVN units to establish MEDCAP programs.

### c. Events

Activity within the squadron AO, during the period 21 - 24 February, was light. On the evening of 22 February, a sniper in one of the troop ambushes sighted and engaged one enemy soldier at a range of 350 meters, resulting in one enemy KIA. On the afternoon of 24 February, a small enemy weapons and ammunition cache was discovered in the eastern Boi Loi Woods.

## 2. (C) LOGISTICAL ACTIVITIES

All supplies except Class I and V were transported overland to the CP at FSB Wood. Class I and V were flown directly to the troop field locations from Cu Chi by CH-47, which were also used to carry other supplies from the FSB to the troop forward locations. Three CH-47 sorties were required daily to resupply each troop.

F-17

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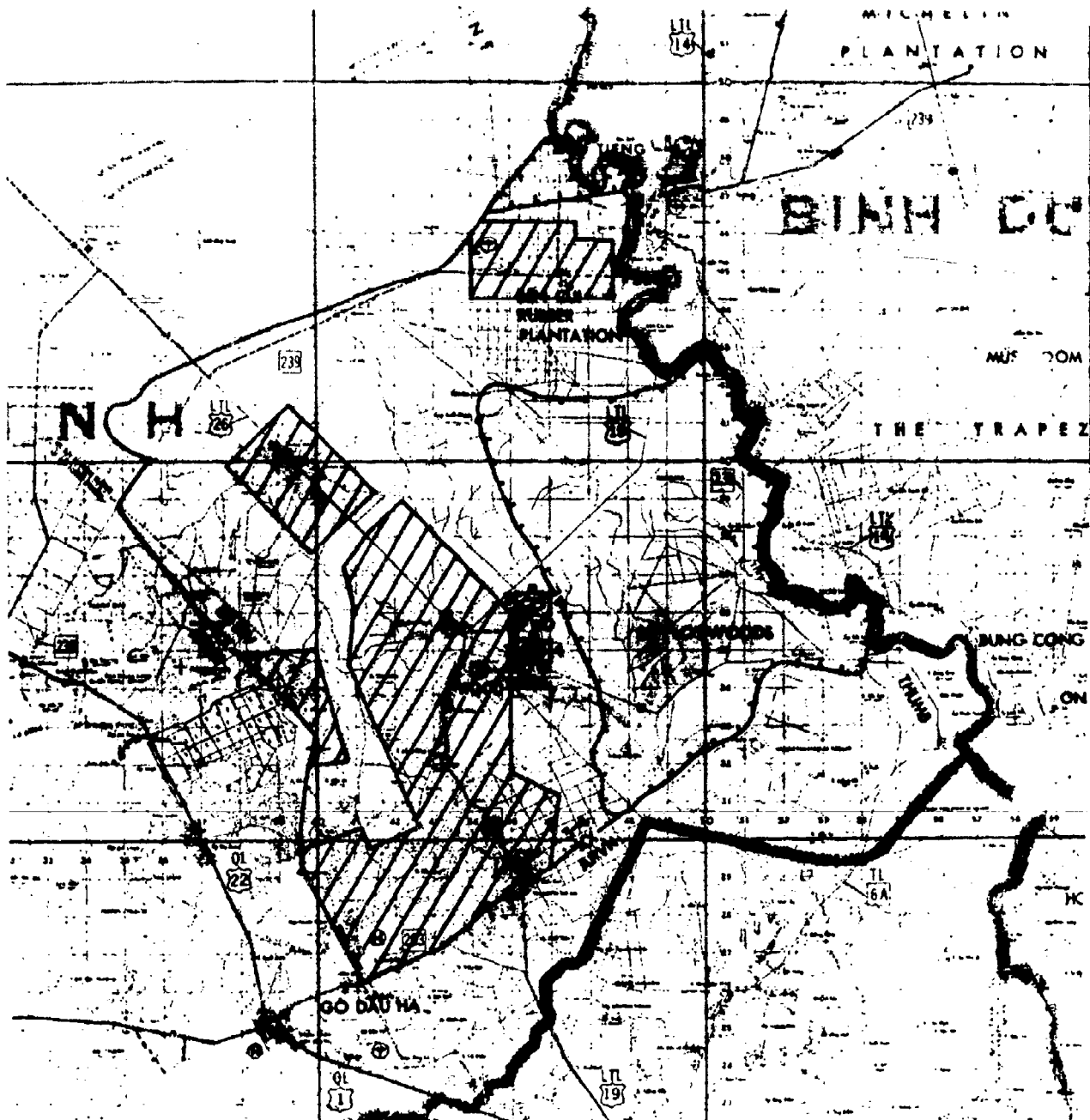


FIGURE F-9 (C). Area of Operations - 3rd Squadron,  
4th Cavalry. (U)

F-18

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Tab E (3d Squadron, 5th Cavalry) to Appendix 2 to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

- (1) To screen in-zone in the southern portion of AO Saddle.
- (2) To prevent enemy infiltration into the Dong Ha Valley from the south.
- (3) To secure Cam Lo/Mai Loc resettlement villages.
- (4) To provide RRF for Cam Lo/Mai Loc resettlement villages, friendly units in the Dong Ha Valley, FSB Elliot (off map to the west), and Quang Tri combat base.

### b. Concept of Operation

The squadron employed two troops in the southern portion of AO Saddle to perform mounted daylight reconnaissance and to establish night platoon-sized NDPs and mounted ambushes. One troop was utilized in a smaller centrally located AO with a standby RRF mission to secure Cam Lo/Mai Loc or to react to any threat in other areas of squadron responsibility. The air cavalry troop was OPCON to the 3rd Brigade, 9th Infantry Division in III CTZ. C/2/34, permanently attached to the squadron, had been placed under OPCON of the 2d ARVN Regiment for an operation to the west near the "Rock File".

### c. Events

Activity during the period, 9 - 13 March, was light. A few enemy sightings were made at night and engaged with no known results. Daylight reconnaissance operations revealed several empty bunkers and small caches, but no contact was made. One M551 AR/AAV detonated a mine, resulting in moderate damage to the vehicle.

## 2. (C) LOGISTICAL ACTIVITIES

Bulk POL was drawn at Dong Ha, where the squadron base camp was located. All other supplies were drawn at Quang Tri and transported to Dong Ha on support platoon vehicles. The troops picked up supplies daily in Dong Ha with organic wheeled vehicles or M548's attached from the support platoon. Air resupply was limited to a hot evening meal delivered daily by UH-1.

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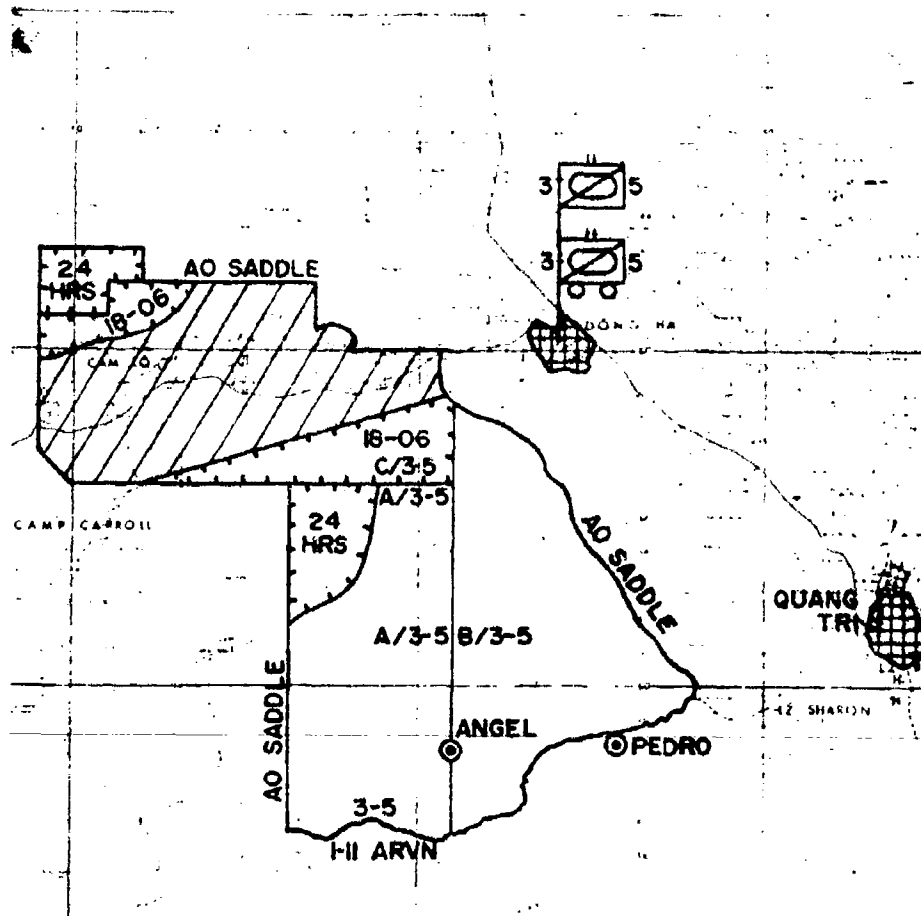


FIGURE F-10 (C). Area of Operations - 3rd Squadron,  
5th Cavalry. (U)

F-20

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## Appendix 3 (Separate Armored Cavalry Troops) to Annex F

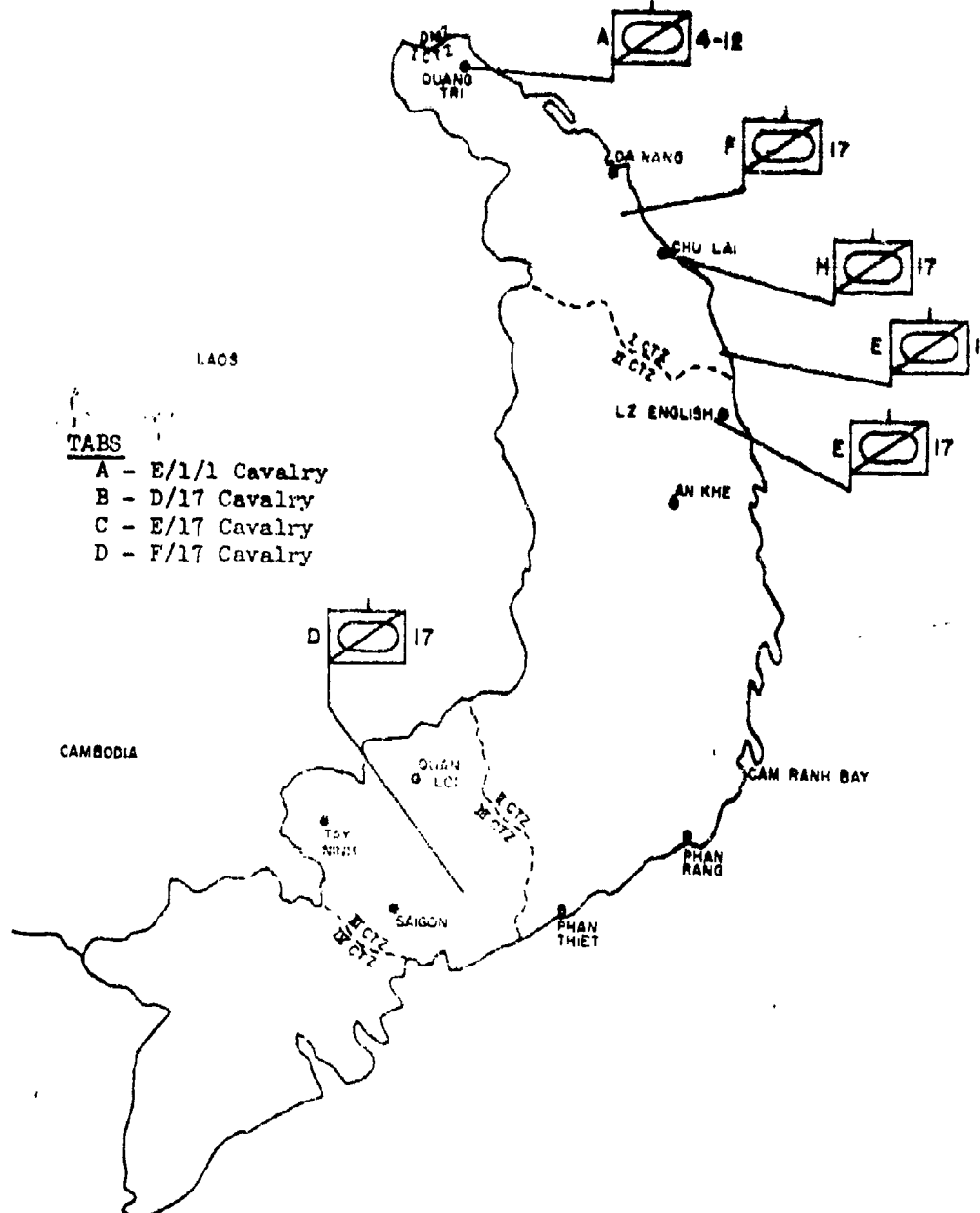


FIGURE F-11 (C). Unit Locations - Separate Armored Cavalry Troops. (U)

F-21

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Tab A (E Troop, 1st Cavalry) to Appendix 3 to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

- (1) To secure QL-1 from FSB Debbie to II CTZ boundary.
- (2) To provide one cavalry platoon each for base defense and MRF nightly at FSB Debbie, the 11th Brigade base at FSB Bronco, and the troop forward CP at the Hardspot.
- (3) To provide daily security for the engineer mine-sweep team which cleared QL-1 from FSB Bronco to the II CTZ boundary.
- (4) To provide daily security for engineer work parties on QL-1 north of FSB Bronco.

### b. Concept of Operations

The troop employed one platoon to provide daylight security for QL-1 from FSB Debbie to the Hardspot and to provide night security and RRF at FSB Debbie, employed one platoon to secure QL-1 from the Hardspot to the II CTZ boundary and to provide night security and RRF at the Hardspot, and employed one platoon for engineer security requirements and night defense and RRF at FSB Bronco. QL-1 was secured by outposting. Other than those areas immediately adjacent to the highway, the troop had no AO. The entire area was a no-fire zone. The three platoons were periodically rotated.

### c. Events

There was no contact on 9 April. The area had been extremely quiet for an extended period.

## 2. (C) LOGISTICAL ACTIVITIES

All classes of supplies were drawn at the brigade base at FSB Bronco. The two southern platoons were resupplied by wheeled vehicles daily. Supplies were dropped off at FSB Debbie and the Hardspot. The platoon based at FSB Bronco resupplied in that location. POL was delivered daily using an unauthorized 600-gallon pod on a 1-1/2-ton trailer, employing gravity feed.

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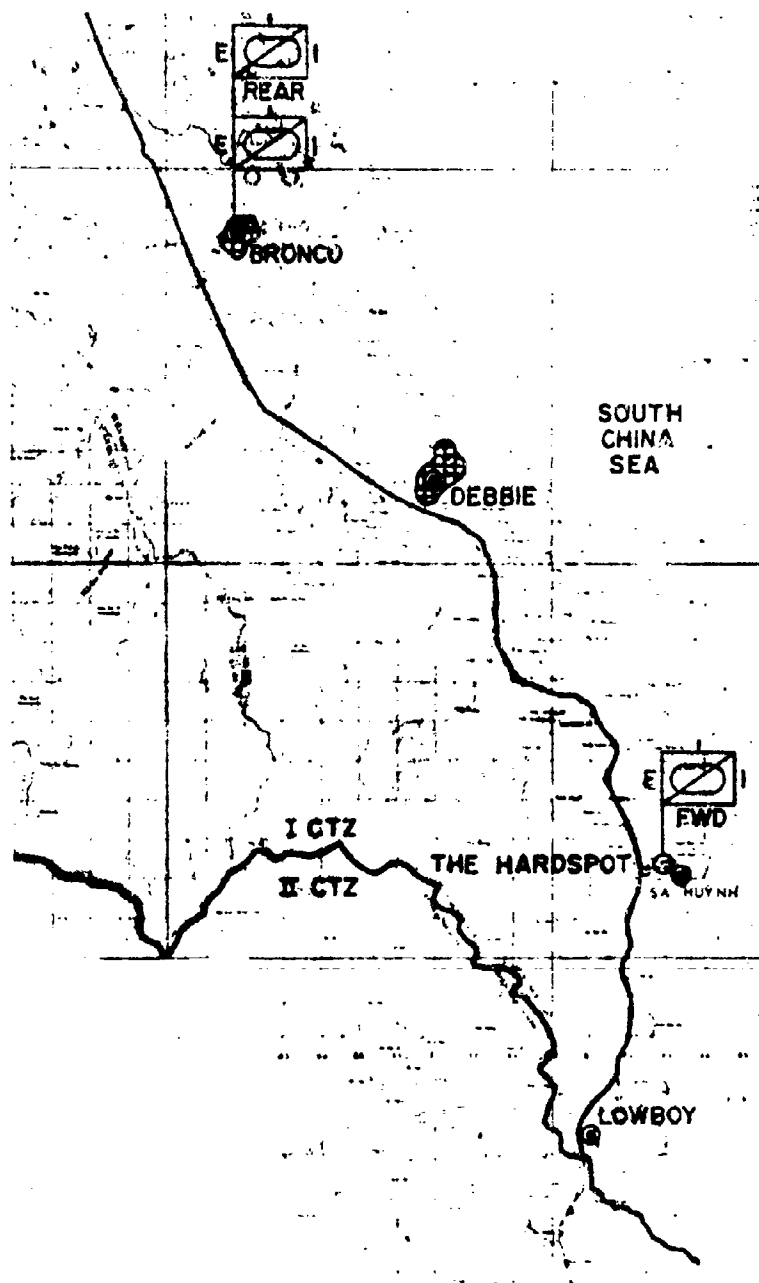


FIGURE F-12 (C). Area of Operations - E Troop, 1st Squadron, 1st Cavalry. (U)

F-23

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Tab B (D Troop, 17th Cavalry) to Appendix 3 to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

- (1) To conduct screening operations in-zone.
- (2) To conduct route reconnaissance on Route 333, Route 334, Route 335, and Route 336.
- (3) Establish NDPs and mounted ambush patrols vicinity SAU MI.

### b. Concept of Operations

The troop established an NDP for the night of 22/23 April near the center of the screen. The remainder of the screen consisted of four mounted and two dismounted ambush patrols. On 23 April, the troop conducted route reconnaissance and established a second NDP.

### c. Events

The troop made no contact on 23 April.

## 2. (C) LOGISTICAL ACTIVITIES

All supplies were drawn at the 199th Light Infantry Brigade rear near Long Binh and transported overland to the troop forward CP at FSB Mace, a distance of 70 kilometers. This was accomplished using one 2-1/2-ton truck daily, and a second truck every third day to transport two 500-gallon POL bladders. Elements forward of FSB Mace were resupplied daily using one CH-47 sortie. Every third day the unit refueled, receiving two 500-gallon bladders by air. Each day a water trailer was taken to the troop and the empty one from the previous day was backhauled. All meals for the forward elements were C rations. The troop had a 2-3 day maintenance standdown every 2-3 months.

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F-25

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Tab C (E Troop, 17th Cavalry) to Appendix 3 to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

(1) To screen the An Lao river valley to the west of the 173d Airborne Brigade base at LZ English and to destroy the enemy in-zone.

(2) Be prepared to reinforce any portion of the brigade AO.

### b. Concept of Operation

The troop established a forward base at LZ Beaver; employed two platoons north of that location and one in the southern portion of the troop AO. The platoons conducted mounted reconnaissance during the day and at night each platoon established an NDP and one dismounted ambush. No platoon AOs, as such, were assigned. Occasionally, NDPs were placed on hills flanking the valley to facilitate observation. During this period, LZ Tane was unoccupied.

### c. Events

There was no contact on 10 April. At approximately 100000 April, the troop received a mission to move southwest of LZ Unlift (off the map to the south) and establish blocking positions prior to first light. By 102000 April, the troop was moving, and at 110500 April it was in position to block for a multi-battalion US/ARVN operation. Later that morning, one M113A1 APC/ACAV hit a mine, resulting in no casualties and moderate damage to the vehicle. At 110815 April, the troop made light contact with an enemy force of unknown size and was receiving sporadic small-arms fire.

## 2. (C) LOGISTICAL ACTIVITIES

All classes of supplies were drawn at the brigade base. The troop was resupplied daily at LZ Beaver by a four-vehicle convoy (three 3 1/2-ton trucks and one M400 POL tanker). The platoons returned to the troop AO for resupply.

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FIGURE F-14 (C). Area of Operations - E Troop,  
17th Cavalry. (U)

F-27

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Tab D (F Troop, 17th Cavalry) to Appendix 3 to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

- (1) To find and destroy all VC/NVA units and installations in the AO.
- (2) To provide one cavalry platoon nightly for brigade base defense at Hawk Hill.

### b. Concept of Operations

During this period, F/17 Cavalry was under OPCON of the 2d Battalion, 1st Infantry. The troop conducted mounted and limited dismounted reconnaissance operations in the assigned AO with two platoons, and retained one platoon at Hawk Hill for base defense and maintenance standdown.

### c. Events

On 19 March, enemy activity was light in the troop AO. One contact occurred during the conduct of the mounted reconnaissance. An RPG-7 was fired from a range of 150 to 200 meters at the troop command group by an unknown number of enemy. No friendly casualties or damage resulted. Fire was returned by organic direct-fire weapons with artillery and gunships supporting. A sweep of the area revealed no enemy. Two kilometers from the scene of this contact, the troop subsequently found 400 pounds of rice and 600 pounds of potatoes while searching a suspected VC hut.

## 2. (C) LOGISTICAL ACTIVITIES

All supplies except Class I and III were drawn by troop personnel at Chu Lai, the 23th Infantry Division base camp to the south. These were normally transported overland, using two 2 1/2-ton cargo trucks and two M548 cargo carriers, to the troop forward base at Hawk Hill. Resupply of elements in the field was accomplished by using approximately three UH-1 sorties daily and one CH-47 sortie every fourth day for POL. One meal of hot rations was delivered daily by UH-1 helicopter.

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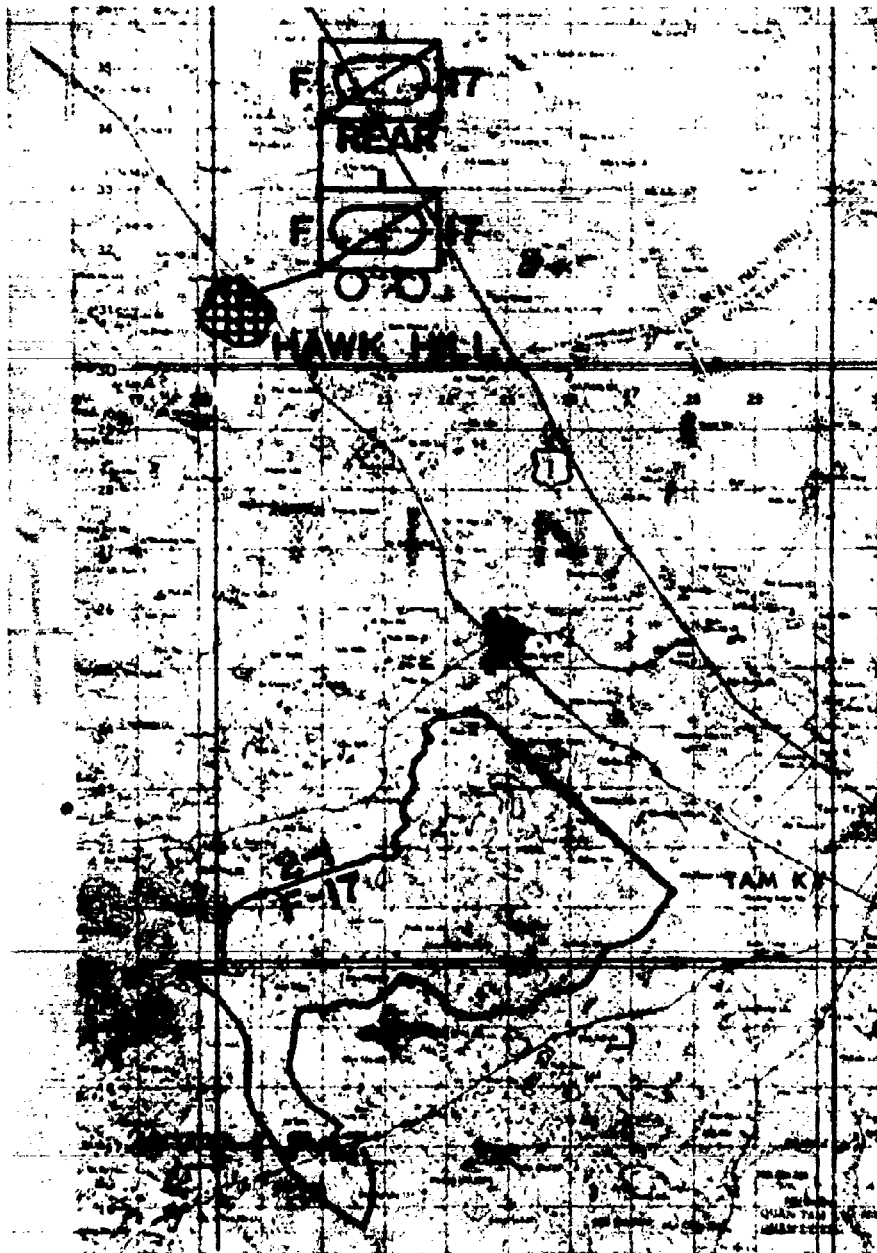


FIGURE F-15 (C). Area of Operations - F Troop,  
17th Cavalry. (U)

F-29

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Appendix 4 (Tank Battalions) to Annex F

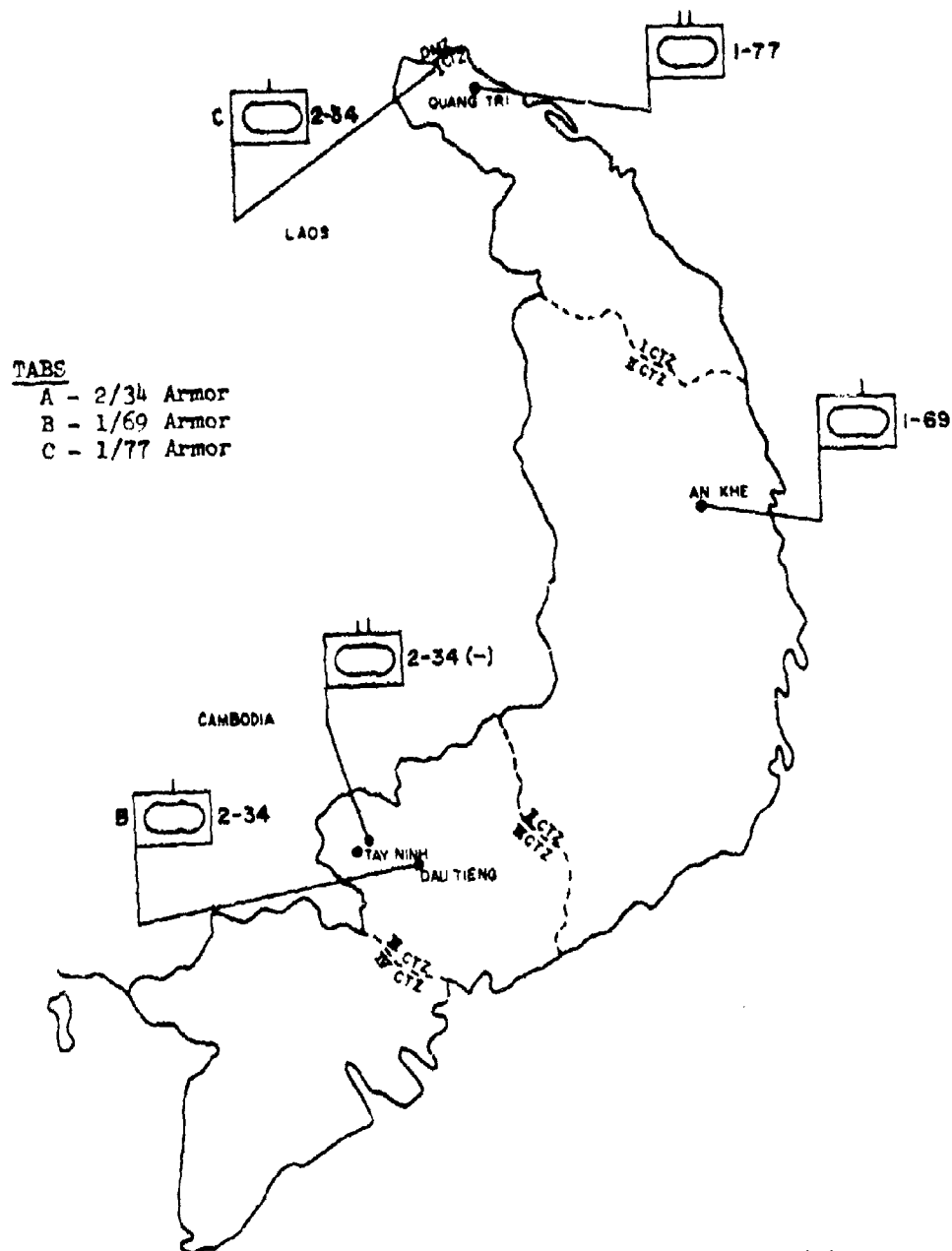


FIGURE F-16 (C). Unit Locations - Tank Battalions. (U)

F-30

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Tab A (2d Battalion, 34th Armor) to Appendix 4 to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

- (1) To find and destroy all VC/NVA units and installations in the AO.
- (2) To harass and interdict enemy movement around and on Nui Ba Den and to conduct VC-food-denial operations.

### b. Concept of Operation

The battalion secured FSB Buell and assisted in security of Tay Ninh base camp, conducted combined mounted and dismounted reconnaissance operations with RF companies and the mechanized infantry platoon normally attached, employed numerous mounted and dismounted night ambushes, and conducted "fireball" operations which consisted of tank firing attacks on the VC located on Nui Ba Den.

### c. Events

Operations from 31 January to 4 February were restricted since the battalion was operating with only two maneuver elements (HHC and Co A). One company was required to secure FSB Buell nightly. Alpha Company was detached through 2 February to reinforce the 3/22 Infantry. During this period, the company received continual harassing mortar and sniper fire, sustaining one WIA, and killed 20 VC. On 31 January HHC cleared and secured a portion of LTL 13, and returned in the afternoon to FSB Buell for maintenance and night security. On 1 February it opened and outposted TL-4 for an engineer heavy equipment convoy. On 2 February HHC conducted mounted reconnaissance in the northeast corner of the AO and established ambushes without results. Alpha Company stood down for maintenance upon its return to the battalion; however, it was subsequently required to send one platoon to secure a convoy vehicle which had hit a mine. On 3 February Company A "fireballed" the southeast portion of Nui Ba Den and ambushed the northern road junction. HHC had a maintenance standdown. On 4 February HHC swept a jungle area northeast of Nui Ba Den while Company A opened TL-4 for a convoy and subsequently returned to FSB Buell for standdown.

## 2. (C) LOGISTICAL SUMMARY

All supplies were moved by road from Tay Ninh base camp to FSB Buell. On occasion, Class III and V supplies accompanied the companies to the field, carried in M548's. Logistical operations were greatly simplified by the short distance between the brigade and the battalion bases. Maneuver companies frequently returned to FSB Buell, which further facilitated logistical operations.

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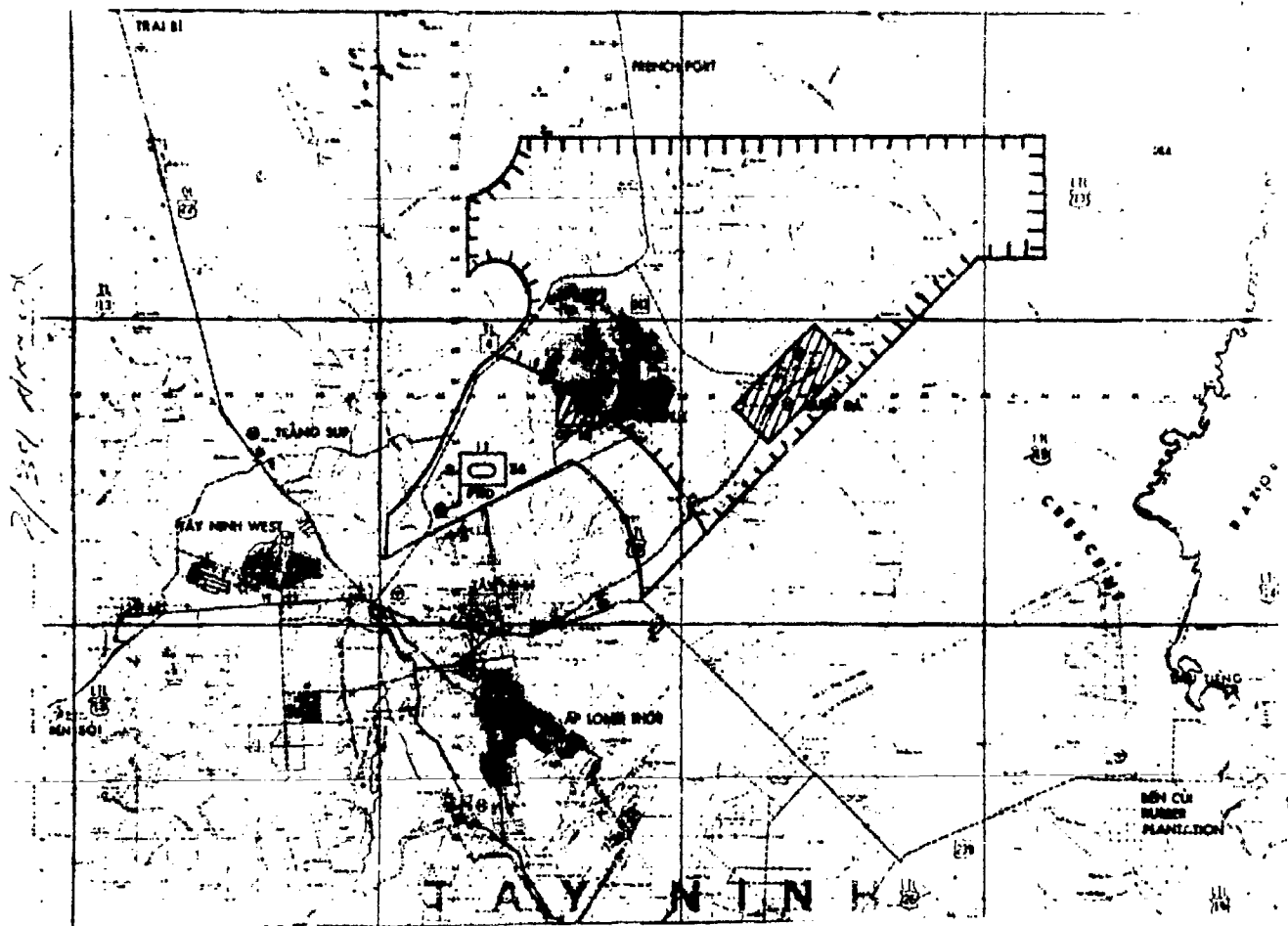


FIGURE F-17 (C). Area of Operations - 2nd Battalion,  
34th Armor. (U)

F-32

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Tab B (1st Battalion, 69th Armor) to Appendix 4 to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

(1) To secure QL-19 and the pipeline from the An Khe Pass to the Mang Yang Pass.

(2) To maintain a brigade reaction force in Camp Radcliff.

(3) To provide, as required, an escort for convoys along QL-19 in-zone and from QL-19 to fire support bases north of the AO.

### b. Concept of Operation

The battalions permanently secured two FSBs (LZ Schueler and LZ Action), five bridges, and a pump station; assisted in securing Camp Radcliff and the 4th Infantry Division base camp at Camp Enari; had each company sweep 12 - 15 km of road and man strong points located along QL-19 during day-light hours; and provided security for four additional bridges at night.

### c. Events

All action during the period was enemy initiated. From 2-5 January it was confined to limited harassing attacks, sniping, and minor pipeline interdiction. On 6 January the VC blew up the main span of Bridge 25 and mined the preconstructed bypass. The battalion increased the number of night ambushes and interdiction fire missions to provide greater area security, and 24-hour security of all bridges on QL-19 was renewed. Those areas east of An Khe that had received sniper fire were swept by elements of the scout platoon and a mechanized infantry company. On the morning of 7 January, VC activity increased. The highway was temporarily closed because the VC had caused a pipeline fire, mined a convoy in the An Khe Pass, and fired small arms and RPGs at strong points near LZ Schueler and in the Mang Yang Pass. Elements in these areas were reinforced by the scout platoon and other reaction forces from LZ Schueler and LZ Action. Eight VC were killed and the highway was reopened.

## 2. (C) LOGISTICAL SUMMARY

All classes of supply were delivered overland from An Khe, using wheeled vehicles. With the long distances traveled daily by many combat vehicles and the excessive length of the AO, Class III resupply constituted the major logistical problem.

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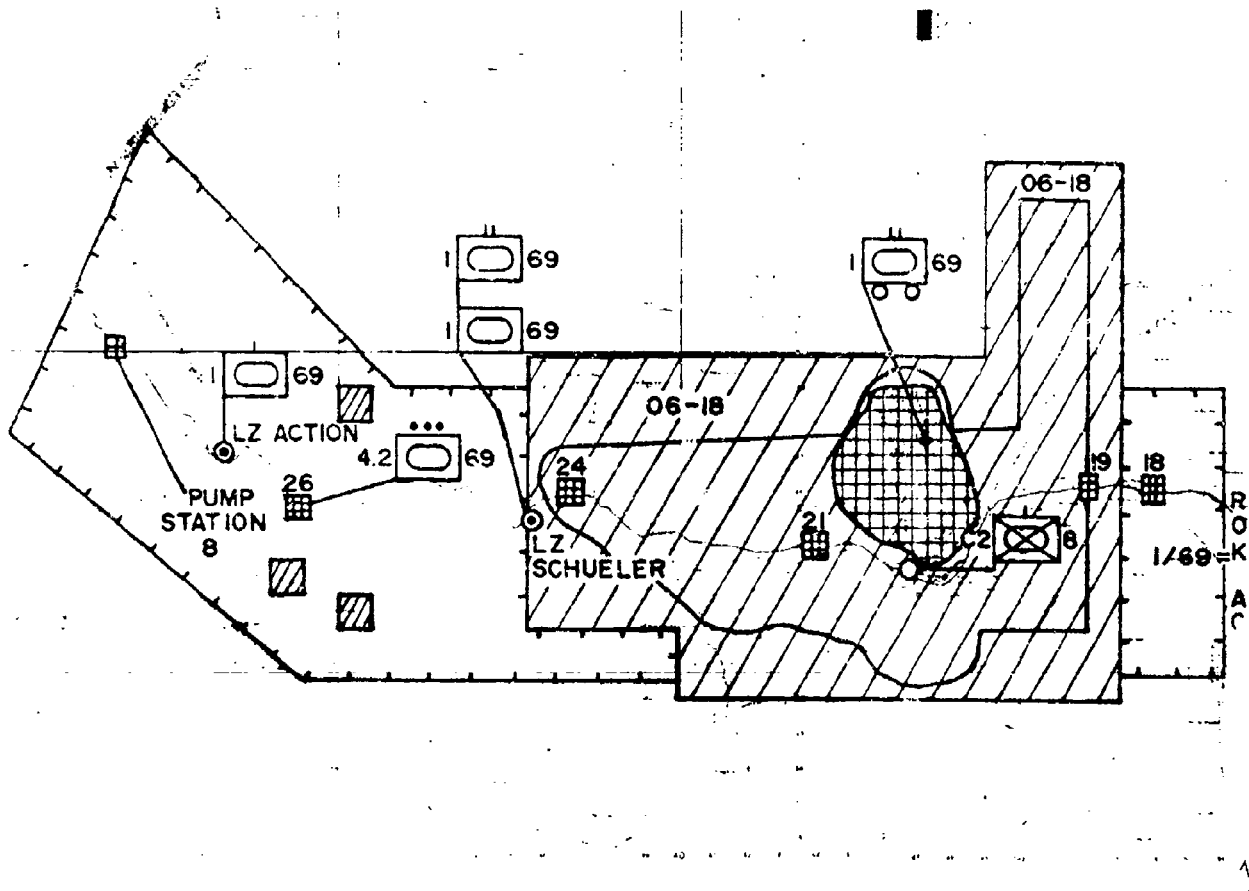


FIGURE F-18 (C). Area of Operations - 1st Battalion.  
69th Armor. (U)

F-34

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Tab C (1st Battalion, 77th Armor) to Appendix 4 to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

(1) To conduct combined operations west of QL-1 in order to train RF companies, prevent VC infiltration into Hai Lang District, and to upgrade security of local villages.

(2) To provide security for the naval base at Cua Viet.

(3) Be prepared to reinforce local ARVN or RF/PF forces in AOs Gold and Black.

(4) To maintain one tank company at Quang Tri Combat Base (QTCB) as the brigade RRF and to assist in base defense.

### b. Concept of Operations

The battalion collocated its forward CP with district headquarters at Hai Lang, where it coordinated the combined operations involving one attached US rifle company and four RF companies; retained the battalion HQ tank section and scout platoon as a RRF for any activity in AOs Gold or Black; deployed A/4/12 Cavalry to Cua Viet, where one platoon was used for base defense and RRF, and the remaining platoons operated north of the river, to prevent VC mining and movement in the area; located one company at QTCB as brigade RRF; and detached two tank companies to TF 1/61 Infantry (M), which operated to the north.

### c. Events

In the combined operation, D/1/11 Infantry and the RF companies established ambushes in AO York Market -- resulting in an average of two VC KIA nightly, mainly from unmanned ambushes. The VC district chief was among the enemy KIA. Extensive psychological warfare and civic action operations were used to supplement ambush operations. A/4/12 Cavalry had two M113A1 APC/ACAVs destroyed by mines. The troop twice had platoon NDPs north of the river probed, which resulted in a VC KIA and some captured equipment. The brigade RRF tank company was not utilized during this period. The two companies operating with TF 1/61 had five tanks hit mines near the DMZ, and twice received mortar fire from within the DMZ.

## 2. (C) LOGISTICAL SUMMARY

The attached infantry company was resupplied by air every third day. All other elements were resupplied overland, primarily by means of M548's. The RRF was collocated with organic support elements and therefore required no resupply effort.

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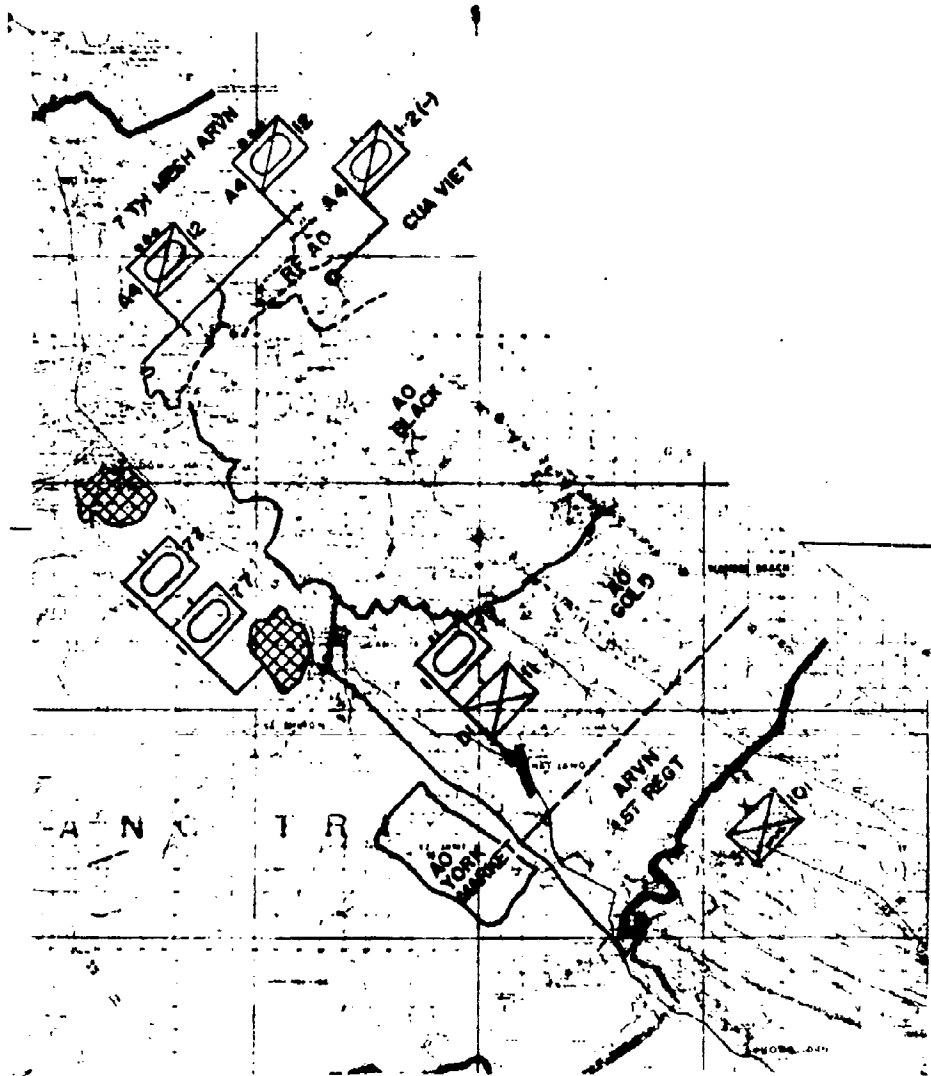


FIGURE F-19 (C). Area of Operations - 1st Battalion, 77th Armor. (U)

F-36

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## Appendix 5 (Mechanized Infantry Battalions) to Annex F

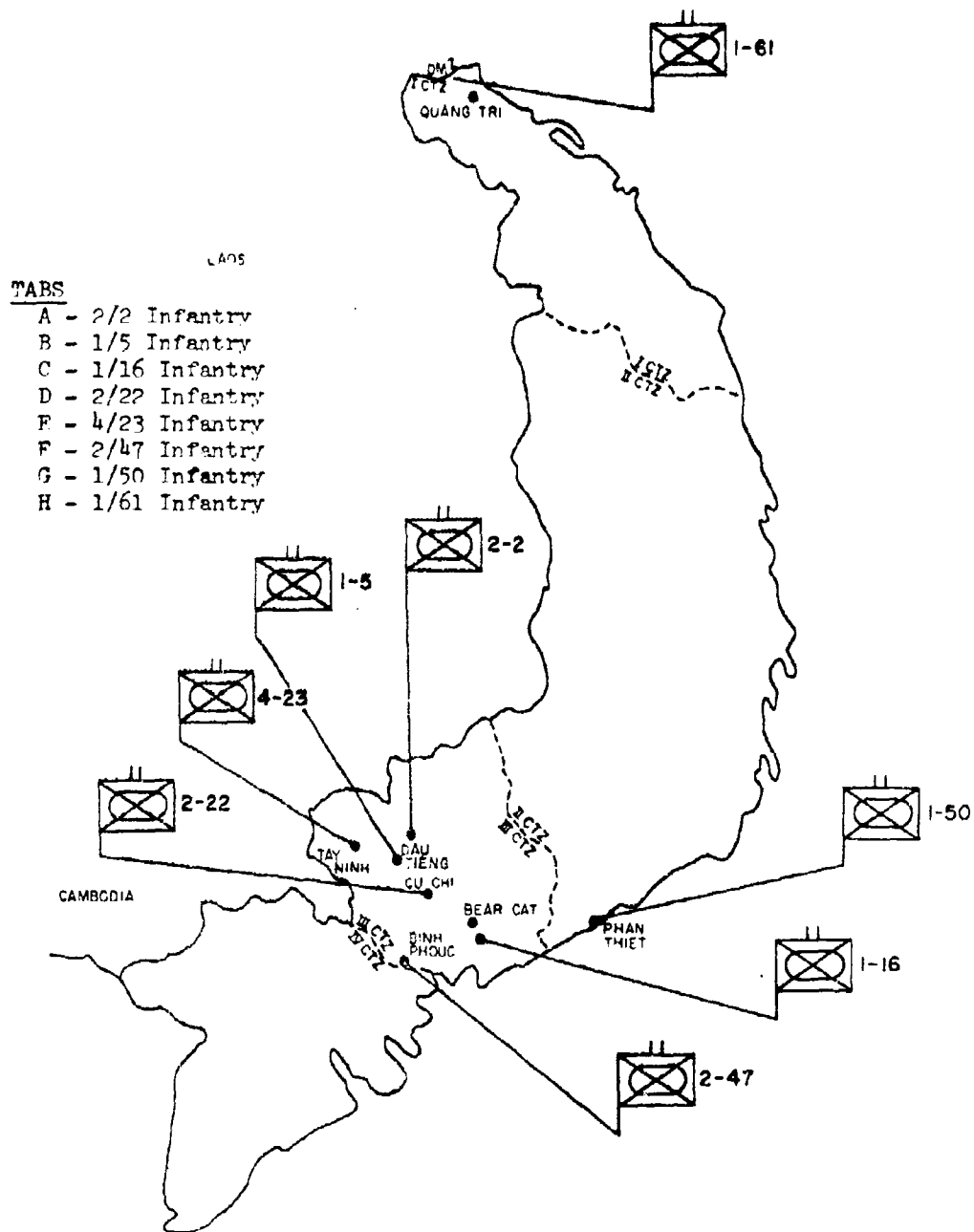


FIGURE F-20 (C). Unit Locations - Mechanized Infantry Battalions. (U)

F-37

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Tab A (2d Battalion, 2d Infantry) to Appendix 5 to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

(1) To find and destroy SR-1 and the 101 NVA/VC Regiment and their base areas.

(2) To eliminate all VC/NVA activity in the area between the Minh Thanh and Michelin rubber plantation.

### b. Concent of Operation

The battalion conducted mounted and dismounted reconnaissance operations in-zone - employing organic companies, attached rifle companies, and one CIDG company - and employed two reinforced scout sections to sweep the road between the two rubber plantations and to deny freedom of movement in the northern portion of the Michelin rubber plantation to the VC.

### c. Events

There was no enemy contact on 12-13 January. Early on the morning of 14 January an attached rifle company sighted movement and engaged a small group of VC. They were reinforced by a scout section and artillery was fired, resulting in six VC KIA and the capture of a large cache of medical supplies, five individual weapons, 100 pounds of rice, and miscellaneous supplies. On 15 January a scout section, which ran a series of automatic ambushes in the northern Michelin plantation, found two bodies. On the morning of 16 January, while sweeping southeast from route 245, B Company found a recently occupied enemy base camp containing over 500 pounds of rice, a complete 60mm mortar with 20 rounds of ammunition, a light machinegun, and two individual weapons with ammunition. A stay-behind ambush later detected movement, and artillery was fired with no confirmed results.

## 2. (C) LOGISTICAL SUMMARY

All supplies were delivered by air from two locations: FSB Iron, located in the Minh Thanh plantation; and Dau Tieng, the brigade base. Operating two logistical bases, with associated security requirements, degraded the battalion's service support. While maintenance facilities at Dau Tieng were excellent, they were poorly positioned to support the battalion. Class I and V supplies were delivered to forward units from FSB Iron.

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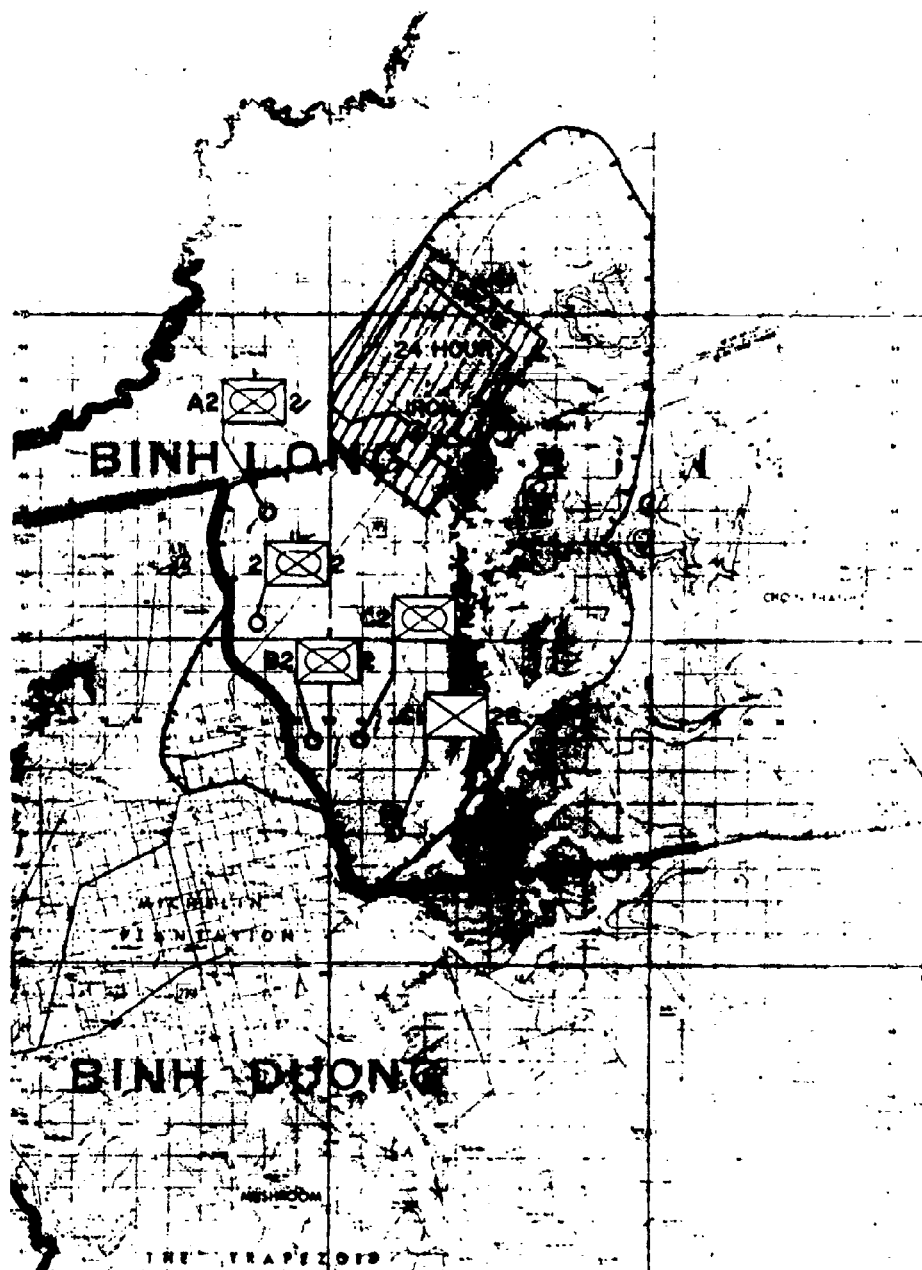


FIGURE F-21 (C). Area of Operations - 2nd Battalion,  
2nd Infantry. (U)

F-39

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Tab B (1st Battalion, 5th Infantry) to Appendix 5 to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

- (1) To find and destroy all VC/NVA units and installations in the AO.
- (2) To deny VC/NVA access to the Michelin rubber plantation area.
- (3) To conduct combined operations with local RF/PF units.
- (4) To secure Dau Tieng base camp, the bridge over the Saigon River in Dau Tieng, and FSB Pine Ridge.

### b. Concept of Operations

The battalion conducted mounted, dismounted, and airmobile operations throughout the AO with four companies - three mechanized and one rifle, employed saturation ambushes with squad and platoon-sized patrols to deny the enemy access to the AO, secured the bridge over the Saigon River and GSB Pine Ridge with one platoon in each location, maintained a minimum amount of combat power at Dau Tieng for defense, and initiated immediate reaction to locally generated intelligence. Locally generated intelligence was used to determine locations for all ambush and patrol activity.

### c. Events

During the three-day period there was little activity. On 16 March, Company A was on standdown in Dau Tieng. Company B operated from an NDP in the central Michelin rubber plantation, with the battalion mortar platoon in direct support. This company conducted platoon-sized daylight reconnaissance operations and night ambushes. Company C, with one rifle platoon attached, conducted an airmobile assault in the northern AO extension, where it established night ambushes along the Saigon River. On 17 March one scout section performed reconnaissance in the northern Michelin plantation, resulted in detention of three VC suspects. On 18 March two small caches were discovered.

## 2. (C) LOGISTICAL SUMMARY

Logistical functions were consolidated at Dau Tieng. All resupply of units in the field was conducted by air due to the high mine threat. Maintenance facilities were well organized and very responsive to unit requirements. The unit maintained its own ammunition dump in the base camp. The unit had on hand large quantities of serviceable and unserviceable excess equipment that were not required for the performance of its mission.

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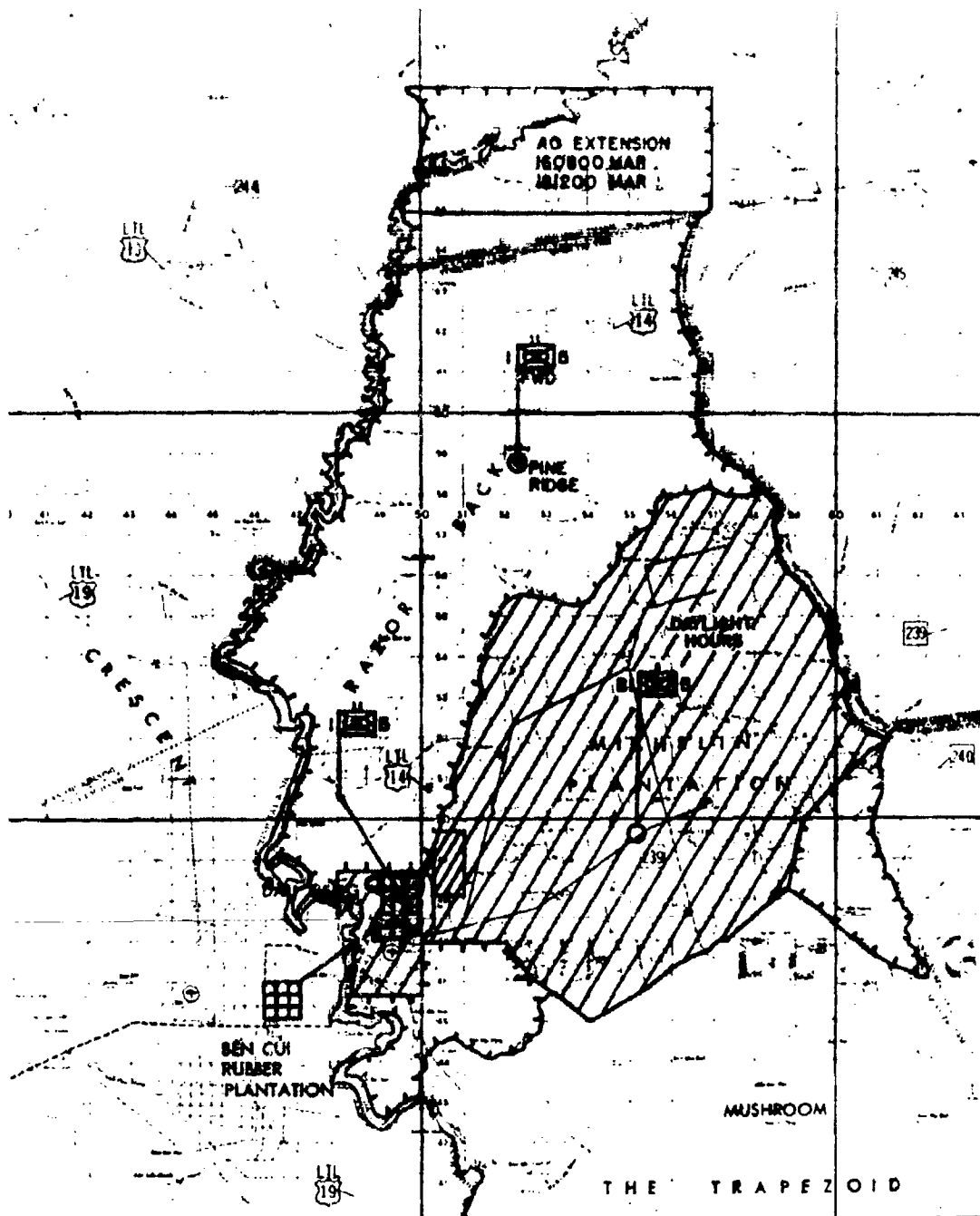


FIGURE F-2 (C). Area of operations - 1st Battalion, 5th Infantry.

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Tab C (1st Battalion, 16th Infantry) to Appendix 5 to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

- (1) To find and destroy all VC/NVA units and installations in the AO.
- (2) To conduct waterborne movement denial operations in the eastern edge of the Rung Sat Special Zone.
- (3) To conduct combined operations with local RF units.
- (4) To secure FSB Dakota, QL-15 in-zone, and assist in securing FSB Colorado.

### b. Concept of Operations

The battalion concentrated on squad and platoon-size mounted/dis-mounted reconnaissance and ambush operations in areas of recent enemy activity; conducted combined operations with RF units daily, employing one mechanized platoon in areas east of QL-15; swept the lowland area west of QL-15 adjacent to the Rung Sat, with two attached rifle platoons reinforced with two scout sections; and employed an attached rifle platoon, mounted in engineer boats, in the Rung Sat to deny the VC use of water routes.

### c. Events

All activity during the period was friendly initiated. On 22 January elements of a rifle company executed an ambush in the edge of the Rung Sat Zone, resulting in three VC KIA and two individual weapons captured. On 23 January, artillery was fired in support of three night ambushes, with no confirmed results. Sweeps of the ambush areas on 24 January revealed some miscellaneous supplies. Early that morning a waterborne ambush fired on a sampan and junk which were violating the curfew. This resulted in three kills and the capture of 100 pounds of rice and 110 gallons of gasoline. One company was on standdown from 23 January to 25 January. On 25 January all elements of the battalion began movement to the south, with elements of three mechanized companies and two RF companies, in preparation for a cordon operation.

## 2. (C) LOGISTICAL ACTIVITIES

All classes of supply except Class III were assembled at Bear Cat, the battalion rear, and then forwarded by unit transportation to FSB Dakota. Class III was delivered to the FSB by the S&T battalion. Resupply was accomplished from FSB Dakota overland by both wheeled and tracked vehicles. Aerial resupply was only used for hot rations. Each evening a mess section was taken to each company NDP with a prepared hot meal and supplies for cooking breakfast.

F-42

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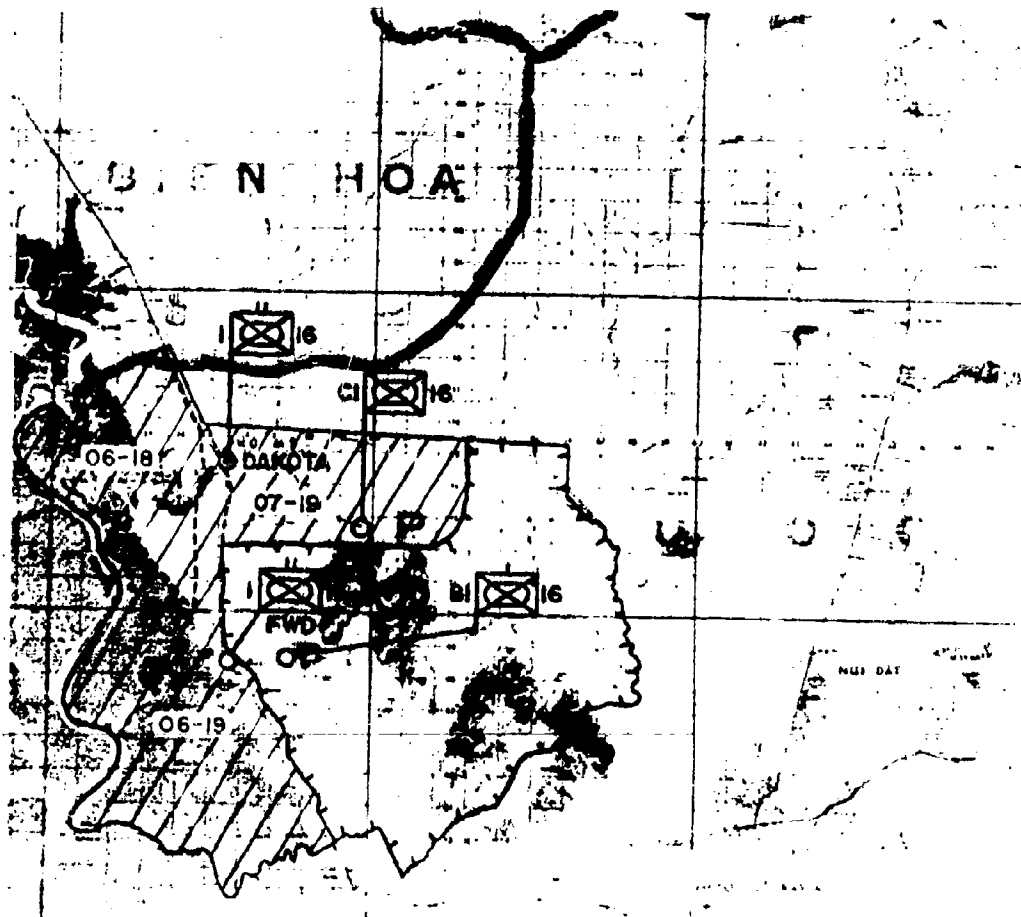


FIGURE F-23 (C). Area of Operations - 1st Battalion,  
16th Infantry. (U)

F-43

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Tab D (2nd Battalion, 22d Infantry) to Annex E to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

- (1) To find and destroy all VC/NVA units and installations and the VCI in the AO.
- (2) To conduct combined operations with ARVN, RF, and PF units.
- (3) To secure FSB Devins and assist in security of Cu Chi.
- (4) Be prepared to reinforce other US, ARVN, RF, and PF forces in the brigade AO.

### b. Concept of Operations

The battalion conducted mounted and dismounted reconnaissance operations in the AO, separately or in conjunction with local GVN forces; conducted night ambushes to destroy the enemy and to deny his access to the population; made extensive use of psychological warfare operations and ICAPs; and conducted coordinated operations in response to radar and electronic surveillance equipment target detections.

### c. Events

On 9 March, one company was in Cu Chi for maintenance standdown and served as the battalion RRF; one platoon was used to establish ambushes in the local area. One company was operating in the northern section of the AO using two platoons for daylight mounted/dismounted reconnaissance and one platoon for night ambushes. The company NDP was moved daily. The company made no contact after responding to two radar detections. On 10 March the company found a huge tunnel network, but no indication of recent use. One company was located at FSB Devins where it employed two platoons for night ambushes. The third platoon was detached, supporting the 2/27th Infantry. The scout platoon and one flame section were OPCON to RF units operating northeast of the AO, where they were being used to clear a heavily booby-trapped area. Extensive counter-VCI operations were conducted daily by the 35 section.

## 2. (C) LOGISTICAL ACTIVITIES

All classes of supply were drawn in Cu Chi. The company operating in that portion of the AO north of Cu Chi was resupplied by two CH-47 sorties daily. Overland resupply was used for all other elements. All company maintenance sections were located in Cu Chi, but accompanied their units to perform normal maintenance operations when required.

F-44

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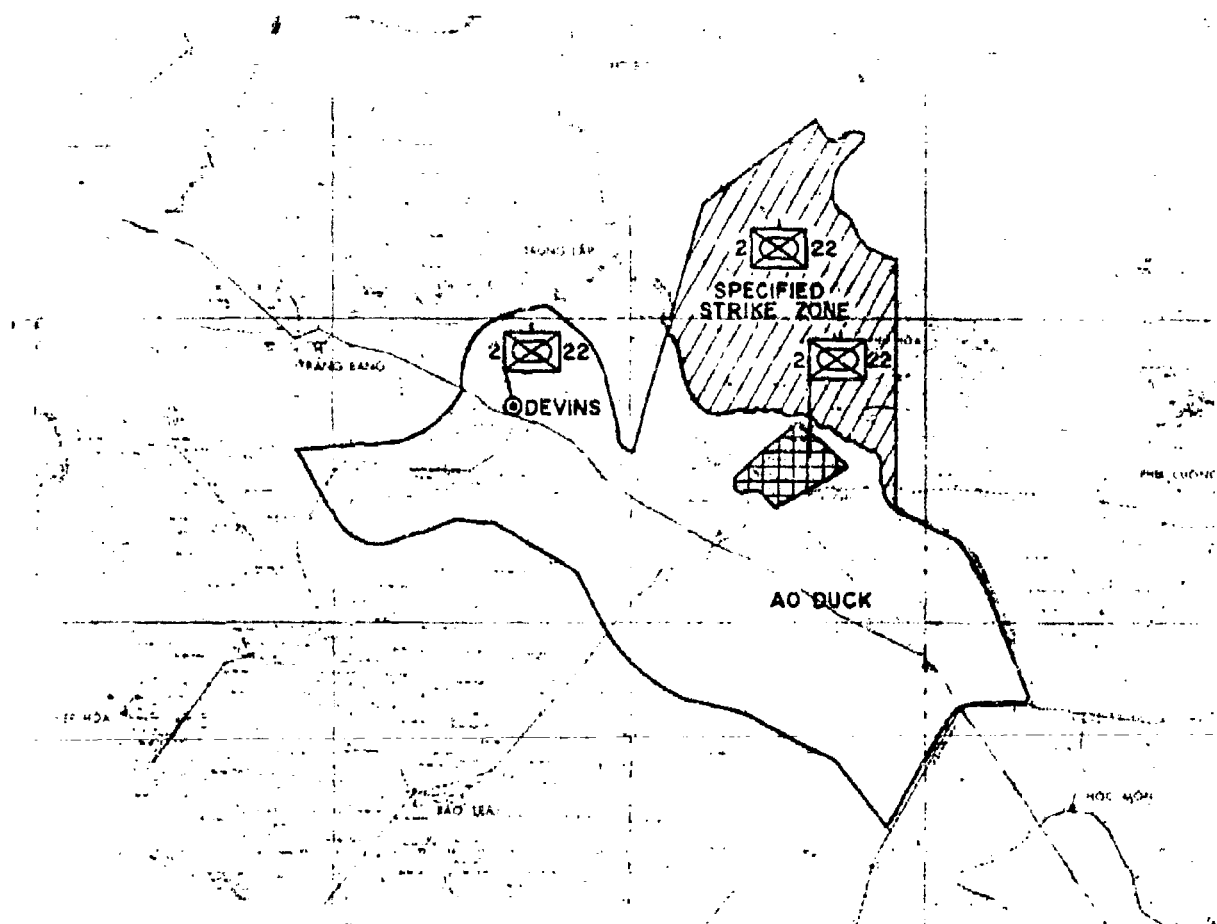


FIGURE F-24 (C). Area of Operations - 2nd Battalion,  
22nd Infantry. (U)

F-45

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Tab F (4th Battalion, 23d Infantry) to Appendix 5 to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

- (1) To find and destroy all VC/NVA units and installations in the AO.
- (2) To conduct combined operations with local RF units.
- (3) To secure FSB Rawlins, FSB Buell, and TL-4 and LTL-26 in-zone.
- (4) Be prepared to reinforce friendly units in the brigade AO.

### b. Concept of Operations

The battalion conducted extensive mounted and dismounted reconnaissance operations throughout the AO, separately or in conjunction with local GVN forces; conducted small-unit night ambushes to deny the enemy access to the civilian population; conducted mine-sweep operations on LTL-26 daily and on TL-4 on call; and **initiated immediate response to locally generated intelligence and surveillance sightings.**

### c. Events

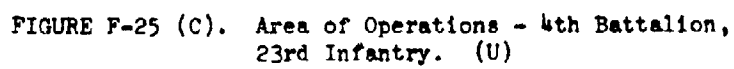
On 26 February, Company C secured an engineer land-clearing operation in the southeastern portion of the AO. Company A conducted daylight ground reconnaissance on the southeastern side of Nui Ba Den and established several night ambushes in the same area. Company B, operating in the eastern part of the AO, made contact with a VC squad, resulting in one US KIA and three US WIA. Night ambushes in this area resulted in one VC KIA. On 27 February, Company C conducted a maintenance standdown at Tay Ninh. Company A continued operations south and west of Nui Ba Den. Each day, the scout platoon swept a portion of LTL-26, and operated in the eastern portion of the AO. Extensive MEDCAP, ICAP, and VCI-elimination operations were conducted in conjunction with district forces.

## 2. (C) LOGISTICAL ACTIVITIES

All classes of supplies were drawn at Tay Ninh and were transported directly to the companies. During the period, no supplies were moved by air. Wheeled supply vehicles were employed between the two FSBs and the rear. Supplies going forward of the FSBs moved by tracked vehicles. All battalion and company maintenance sections were located in Tay Ninh.

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F-47

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Tab F (2d Battalion, 47th Infantry) to Appendix 5 to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

- (1) To destroy all VC/NVA units and installations in the AO.
- (2) To prevent VC/NVA infiltration into Binh Phuoc district.
- (3) To conduct combined operations with local GVN forces.
- (4) To secure FSB Binh Phuoc.

### b. Concept of Operations

The battalion conducted numerous combined operations in reaction to locally generated intelligence; conducted limited daylight mounted reconnaissance, airmobile assaults, and show of force operations; and, in close coordination with US/GVN intelligence-gathering agencies, conducted extensive night interdiction operations characterized by dismounted ambush patrols and mounted reaction.

### c. Events

On 23 March, two companies prepared for night ambush operations. One company conducted checkerboard sweeps and daylight ambush patrols in AO Gabriele and returned to the battalion FSB at noon. The scout platoon secured engineer road construction operations. Prior to dusk, Company A left the FSB for AO Norwich to set up night ambush patrols. One platoon made contact en route, resulting in one VC KIA. A subsequent morning search of the contact area resulted in six US casualties from boobytraps. Company C moved at dusk to AO Coldwater. That night two of its ambushes made contact. They were supported by gunships, artillery, and tactical air resulting in one US KIA, six NVA KIA, and the capture of five AK47's, documents, grenades, and small-arms ammunition. On 24 March, B Company stood down, while A and C Companies swept the contact areas. The scout platoon secured the flame section on a nipa burning mission and prepared for night activities. That night, all companies and the scouts conducted ambushes, three of which made contact resulting in five VC KIA, two Hoi Chanhs, and one detainee. On 25 March, Company A, with two RF companies, conducted airmobile checkerboard assaults. Company B, on a sweep, received small-arms fire in a short contact.

## 2. (C) LOGISTICAL ACTIVITIES

All classes of supply were drawn by the support platoon at issue points located in Tan An or Long Binh. Most company resupply was conducted at the FSB. Occasionally companies were required to be resupplied by road in field locations. The battalion maintained Class III, IV, and V at the FSB. In-operative vehicles were normally returned to the FSB, where the maintenance platoon and a DS contact team were located.

F-48

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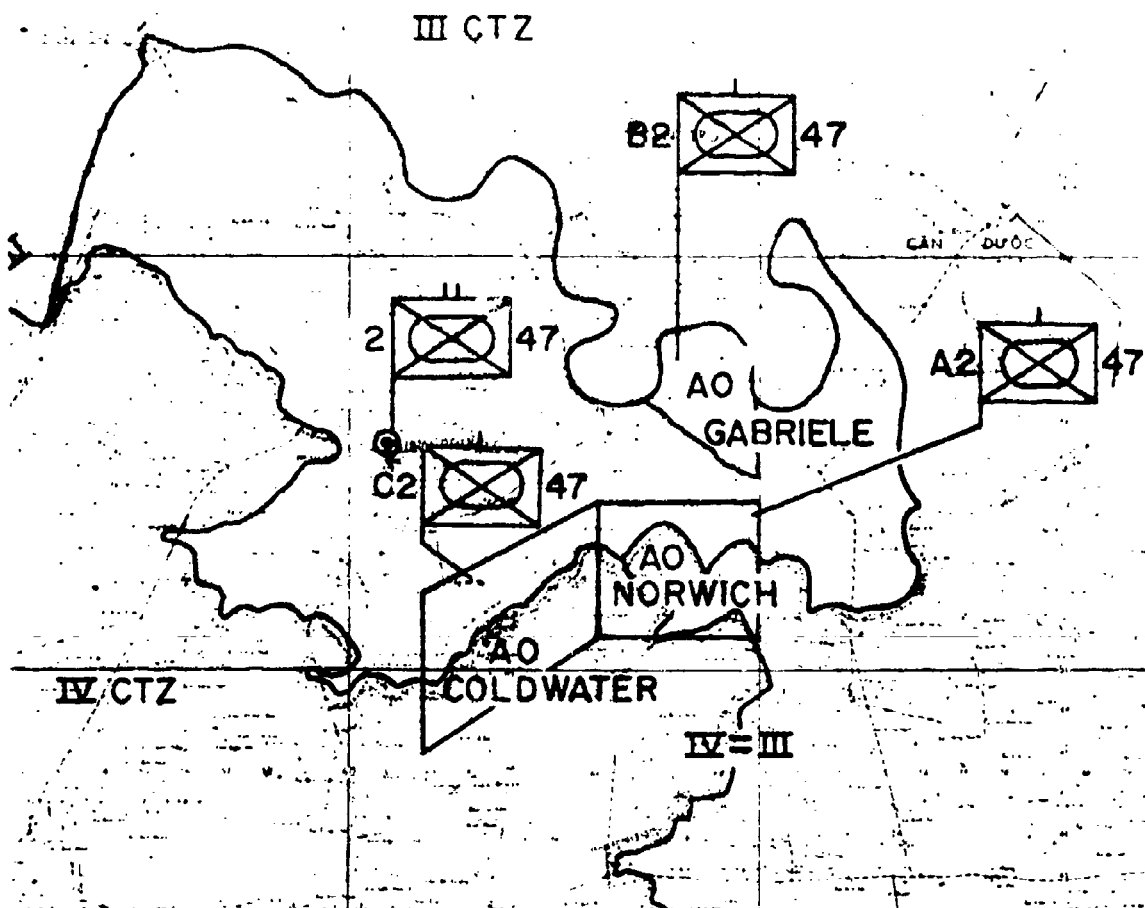


FIGURE F-26 (C). Area of Operations - 2nd Battalion, 47th Infantry. (U)

F-49

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Tab G (1st Battalion, 50th Infantry) to Appendix 5 to Annex F

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

- (1) To destroy all VC units and installations in the AO and deny the VC access to the populated areas.
- (2) To conduct combined operations with local ARVN and RF/PF units.
- (3) To secure LZ Betty, FSB Sandy, FSB Sherry, and Whiskey Mountain.

### b. Concept of Operations

The battalion conducted combined reconnaissance operations with maximum available combat power, employed one company for dismounted and/or airmobile operations as directed by TF South, and **provided the scout platoon** to the Thien Giau District Chief for employment.

### c. Events

During the entire period, Company B was attached to the 2/1 Cavalry. Company C operated with two different ARVN companies in the Le Hong Phong forest area where several bunker complexes and small base camps were found. One platoon of Company A conducted operations around FSB Sandy with an RF platoon. Contact was made twice with small groups of VC west of Sandy, resulting in three VC KIA. Another platoon conducted similar operations around FSB Sherry. The third platoon secured LZ Betty and concurrently performed maintenance. The scout platoon operated as two sections, each with one 4.2-inch mortar squad and a platoon of RF attached. **One section was located southeast of Whiskey Mountain, and the other operated north of Thien Giau, where the battalion forward CP was located.** On 10 April the scouts suffered four WIA from boobytraps.

## 2. (C) LOGISTICAL ACTIVITIES

The battalion was responsible for supporting TF South headquarters in addition to its organic elements. All supply was received from the Cam Ranh Bay Army Depot by either sea or air. A small logistical support activity was located at LZ Betty, but it had only a very limited resupply and maintenance capability. Nearly all equipment requiring DS-level maintenance had to be evacuated by sea to Cam Ranh Bay. This caused excessive time for repair and return of equipment to operational status. Most resupply of maneuver elements was by air.

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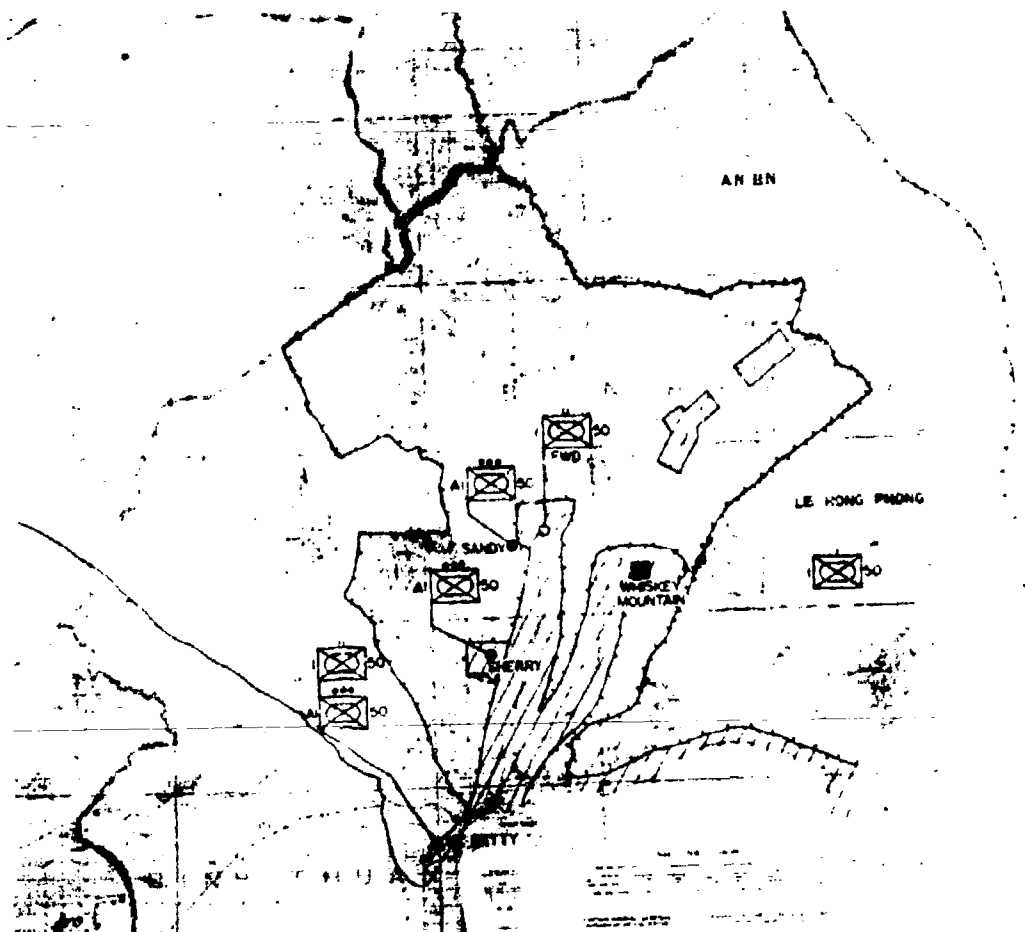


FIGURE PART (C). Area of Operations - 1st Battalion,  
50th Infantry. (U)

F-51

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Tab # (1st Battalion, 61st Infantry) to Appendix 5 to Annex 7

## 1. (C) OPERATIONAL SUMMARY

### a. Missions

- (1) To destroy all VC/NVA units and installations in the AO.
- (2) To prevent enemy infiltration into the Cam Lo area.
- (3) Secure Fire Support Bases A-4 and C-2.

### b. Concept of Operation

The battalion conducted company-size search-and-clear operations daily throughout the AO, with extensive cross-attachment between tank and mechanized infantry elements; secured FSBs A-4 and C-2; and swept the ground LOC for mines daily. Operations just below the DMZ against regular NVA forces constituted a kind of war different from that fought elsewhere in RVN. The battalion could not conduct platoon-size operations because of its proximity to large NVA elements. The unit faced a severe mine threat and, as contrasted to other areas in RVN, units operating in AO Orange were subject to observed indirect fire attacks from the DMZ or North Vietnam.

### c. Events

The battalion had two tank companies attached in addition to its organic infantry companies. On 30 March the battalion received a warning order to prepare to move west, in conjunction with elements from the ARVN 1st Division, to block the withdrawal of the 27th NVA Regiment. During the move on 31 March the battalion was delayed by numerous mines on the road between C-2 and A-4. One M113A1 was destroyed, resulting in three US KIA. By nightfall, all three companies had reached the western edge of AO Orange and established NDPs. The tank companies remained in the east to secure C-2 and A-4 and to conduct limited reconnaissance operations in the local area. Early on 1 April, A-4 and three other outposts in the brigade AO received mortar and rocket fire. That morning the battalion moved west where they received mortar, rocket and small-arms fire. They were supported by artillery and gunships, resulting in five NVA KIA. Contact continued as the companies moved further west, finding numerous small caches, mines, and prepared ambush sites.

## 2. (C) LOGISTICAL ACTIVITIES

All battalion service support elements were located at C-2. Class III was delivered to C-2 by support units. The battalion was responsible for drawing all other classes of supply at Quang Tri Combat Base. Supplies were then transported by road to C-2. Resupply of the companies was accomplished by ground or air depending upon the duration of the operation and location of the unit. An ordnance contact team was collocated with battalion maintenance at C-2.

F-52

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## ANNEX G

### ARMORED CAVALRY REGIMENT

#### 1. (C) EMPLOYMENT

##### a. Missions

The conventional roles and missions normally assigned to an armored cavalry regiment (ACR) have become modified in the RVN environment. In stability operations the ACR was used as an offensive fighting unit to find and destroy the enemy. The missions assigned to the regiment and to the regimental squadrons were typical of missions assigned to mechanized and armored units in RVN. The ACR operated for long periods in relatively fixed AOs rather than constantly moving within the Corps or Field Army zone (Figure G-1). While the regiment was normally under the operational control of a division, in all other respects it was a separate entity. The ACR was a uniquely powerful organization to perform in this modified role. However, the change in role and method of operation, coupled with administrative and logistical requirements peculiar to RVN, impacted upon organization and equipment requirements. Figure G-2 shows the relative commitment of the combat strength of each squadron to type missions during the evaluation. Types of missions have been grouped into broad categories for simplicity and to avoid confusion in terms (for example, the doctrinally accepted term, "reconnaissance in force," was called by several different names in Vietnam, ranging from "search and destroy" to "protective reaction"). Analysis of Figure G-2 shows the relatively uniform pattern of mission assignments. In general, commanders felt that security missions, while probably necessary, did not take full advantage of the squadron offensive capability.

##### b. Organization for Combat

(1) The regiment had attached, on a permanent basis, an armored combat engineer company. At various times, although not during the evaluation, squadrons were detached from the regiment, and occasionally the regiment had operational control over an infantry battalion. At a lower echelon, companies or troops were detached temporarily or for extended periods of time. During the entire evaluation period, D Company (Tank), 1/11 Cavalry was attached to the 199th Light Infantry Brigade. The regiment normally attached an armored engineer platoon to each squadron and frequently provided assets from the air cavalry troop.

(2) Because of the inherent power and flexibility of the armored cavalry squadron, the formation of internal task organizations was not normally necessary; however, when a task organization was required, it was most frequently for "jungle busting," and a tank platoon was attached to a cavalry troop for this task. The cavalry troops were rarely scrambled, as all commanders desired to retain the flexible platoon organization. Figure G-3 contains an organizational chart for the armored cavalry regiment.

G-1

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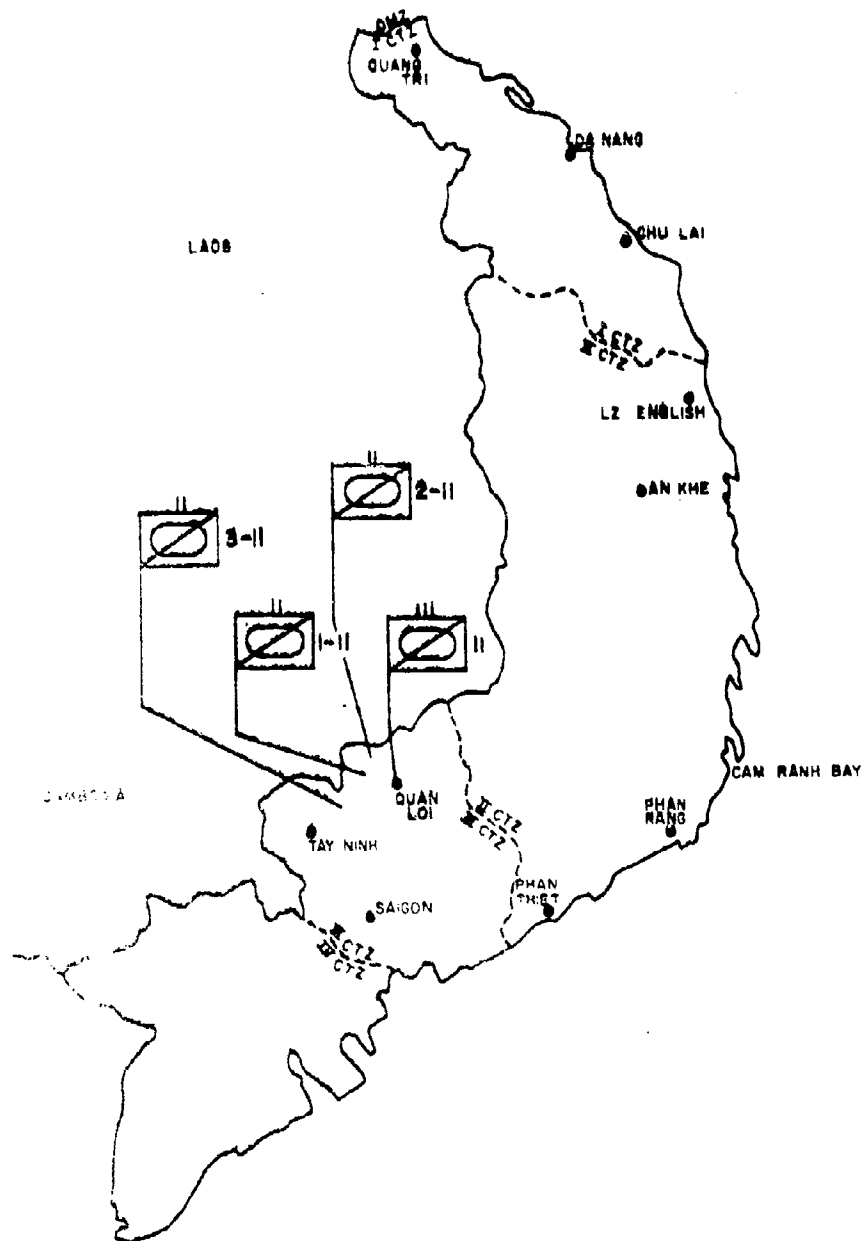


FIGURE G-2 (C). Location of 11th ACR Elements During Evaluation. (U)

G-2

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UNIT	DAYLIGHT MISSIONS (1)									NIGHT MISSIONS (2)	
	RECONNAISSANCE OPERATIONS	SECURITY OPERATIONS	READY REACTION FORCE	MAINTENANCE STAND DOWN	CIVIL ACTION	ROAD CLEARING	OTHER	NIGHT DEFENSIVE POSITIONING	AMBUSH PATROL AND STRONG POINTS		
1/11 CAV	55%	16%	1% (3)	18%	4%	9%	12% (4)	89%	11%		
2/11 CAV	51%	22%	23% (5)	2%	2%	26%		80%	20%		
3/11 CAV	50%	23%	11% (5)	9%	6%	18%	1% (6)	8%	15%		

## Notes:

- (1) Total percent for each unit is greater than 100 percent due to the commitment of combat elements to more than one mission per day.
- (2) See Glossary of Terms (Annex A) for mission definitions.
- (3) Tank Co detached from squadron during entire period of evaluation.
- (4) Road march to new AO.
- (5) Maintenance performed with RRF mission in forward area.
- (6) One troop conducted one day tank crew proficiency course.

FIGURE G-2 (C). Average Combat Power Committed to Each Type of Mission, ACR (U).

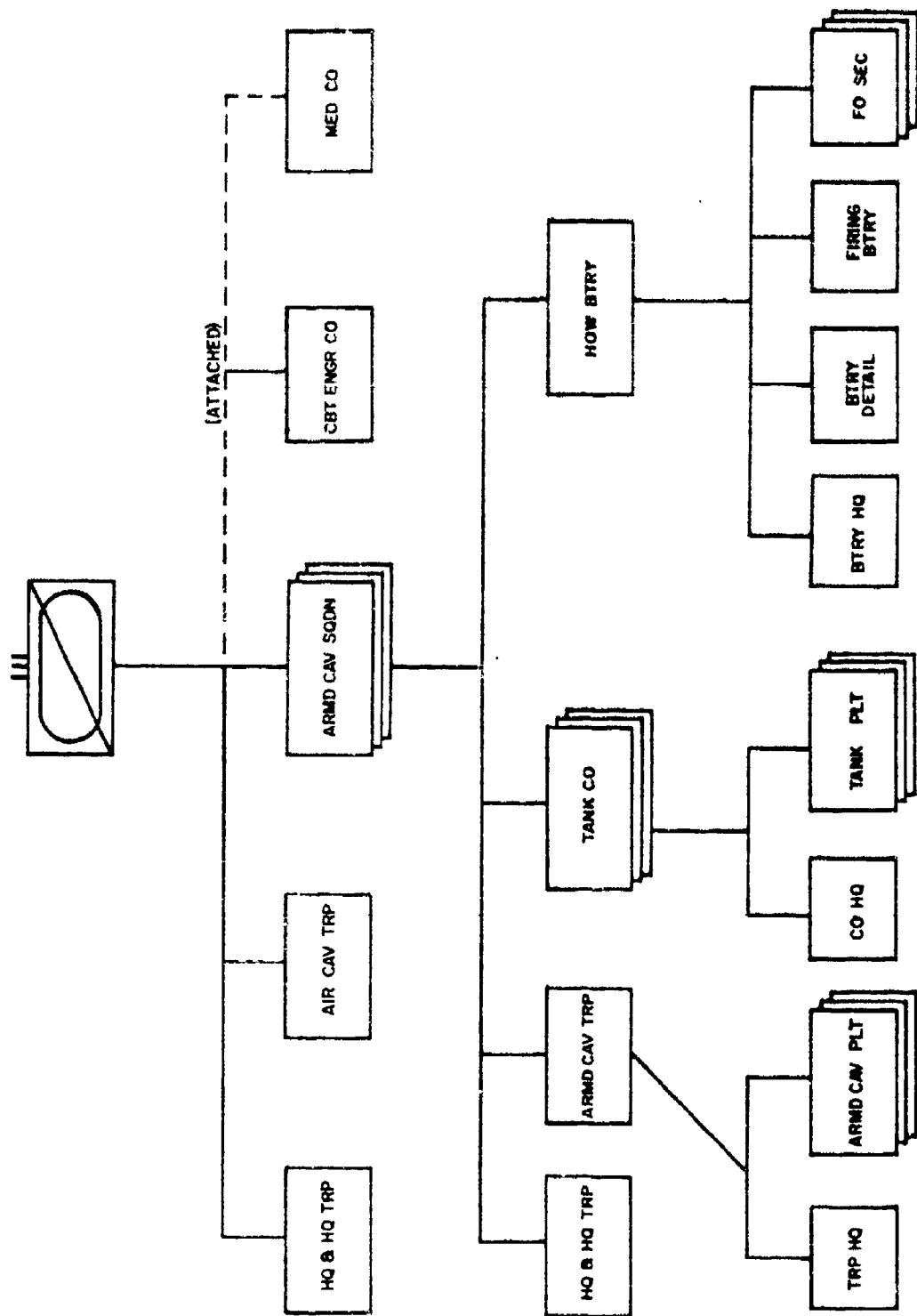


FIGURE G-3 (U). Organizational Chart, 11th ACR.

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Figure G-4 depicts the combat assets that were available to the squadrons during the evaluation period. As can be seen, the squadrons' organization for combat remained relatively close to the TOE organization.

UNIT	ORGANIC ELEMENTS AVAILABLE					OTHER ELEMENTS AVAILABLE						
	ARMED CAV TRPS			TANK	HOW	ENGR	INF ODS (US)		TANK	INF	OTHER	
	1	2	3	CO	STRY	PLT	1	2	CO 3/11	CO (ARVN)	ARTY STRY (-)	ENGR LC CO
1/11	100%	100%	30%	8%	100%	85%	25%	25%	20%			
2/11	100%	100%	75%	100%	100%	100%	15%				100%	55%
3/11	100%	100%	80%	70%	100%	100%	25%			10%		

FIGURE G-4 (C). Average Available Combat Power for the 11th ACR During the Evaluation Period (U).

(3) In addition to the organic and attached units indicated in Figure G-3, the squadron also had access to other combat power in the form of non-organic indirect fire support. During the evaluation the squadrons received an average of three artillery, one armed helicopter, and one close air support missions per day. All commanders felt this support was adequate in volume but in some cases not sufficiently responsive.

## c. Tactics

### (1) Reconnaissance-in-Force Operations

The majority of the operations conducted by the regiment were reconnaissance-in-force, although several other terms were used on occasion. Varying from other US armored units in RVN, in which platoon-level operations were common, operations in the regimental AO were normally at the troop level, each troop being given an AO ranging in size from 2 to 40 square kilometers depending on the type of terrain and vegetation encountered and on the reported enemy situation. Platoon AOs were not assigned in the ACR AO because of the dense jungle, which covered 87 percent of the regimental AO, and the enemy threat. In the opinion of commanders, the presence of large NVA forces in or near the AO, and the difficulty of rapid reinforcement of elements operating in the jungle, necessitated the conduct of operations in troop strength. While operating in the jungle, a double or triple column was normally used, to minimize mine danger to vehicles, to facilitate control, and to provide flank security (Figure G-5). When contact

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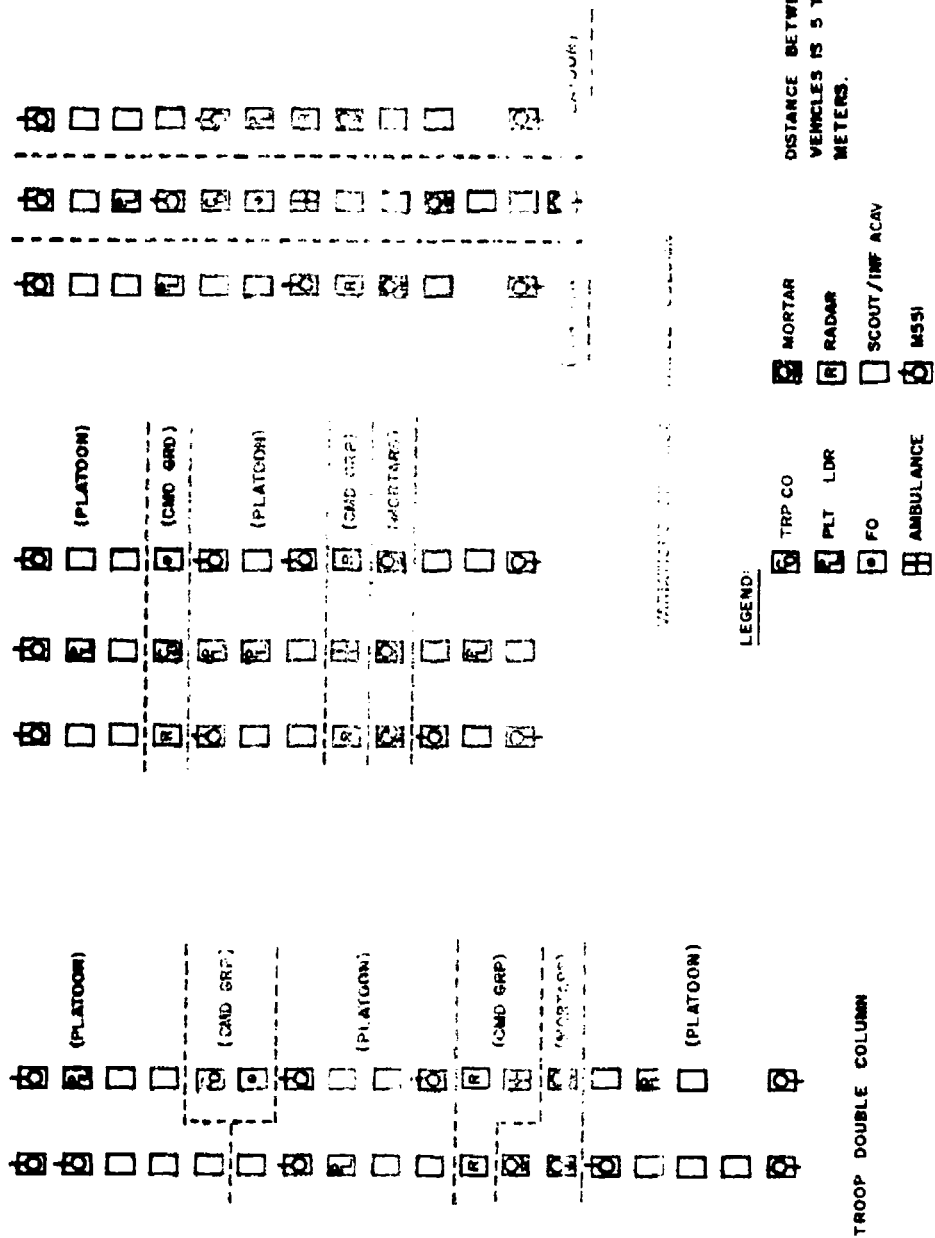
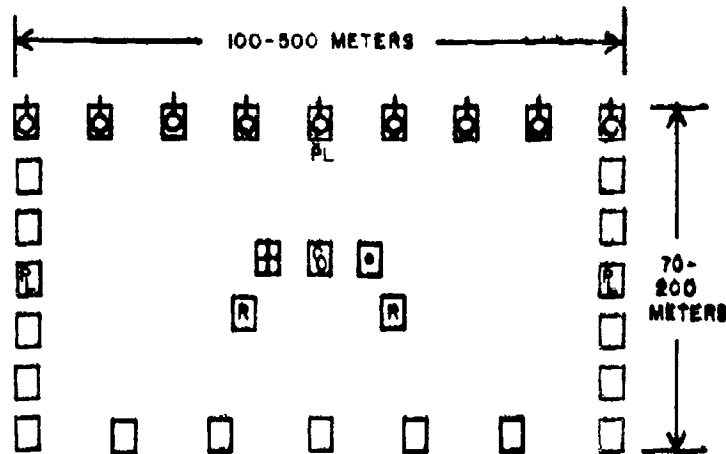


FIGURE G-5 (U). Standard Cavalry Troop Column Formations.

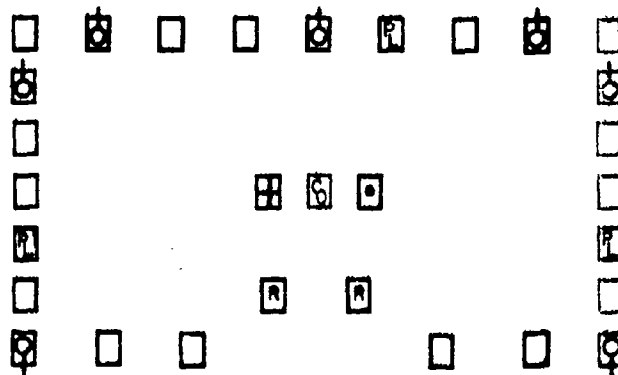
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appeared likely, or was established, the troop/company moved into the box or modified wedge formation (Figure G-6). This formation provided for good control, all-around security, and placed firepower in all directions. The box formation was also used to provide a relatively secure area for small dismounted elements to perform detailed searches for bunkers, tunnels, and caches. If contact was made while still in column, the unit would "herringbone," employ suppressive fires, and then assault in an attempt to



## M551 SCRAMBLED

ONE PLATOON LEADER COMMANDS M551'S, ONE PLATOON LEADER COMMANDS EACH PLANK, MORTARS MAY ACCOMPANY TROOP.



## PLATOONS INTACT

FIGURE G-6 (U). Type Cavalry Troop Box Formations.

G-7

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overrun the enemy and to get out of the killing zone. Indirect fires were placed behind the enemy to enable the unit in contact to maintain pressure on the enemy while escape routes were blocked. Similar tactics were used in operations in rubber plantations. In more open areas, troops occasionally operated with three platoons maneuvering in close proximity to each other. The formations used were as indicated in Figure G-7.

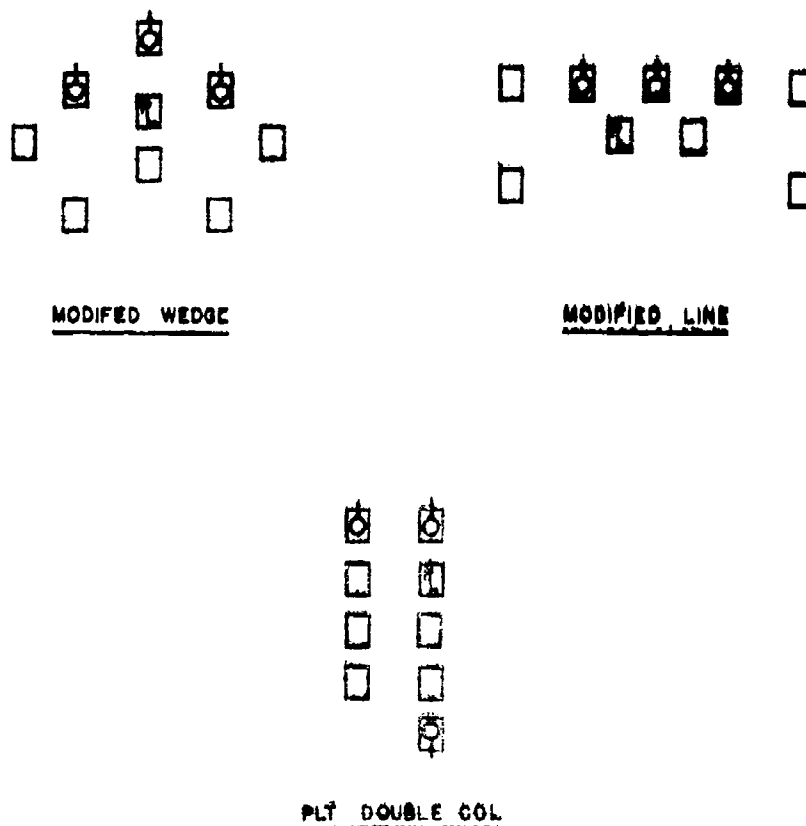


FIGURE G-7 (U). Type Cavalry Platoon Formations.

## (2) Security Operations

(a) Elements of the regiment engaged in various types of security operations on almost a daily basis. The most common tasks assigned were security of convoys, engineer work parties, fire support bases (FSB), and populated areas.

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(b) Convoy security normally required sweeping the road for mines prior to transit of the convoy. This operation was critical, since mines were a greater threat to elements using the road than ambushes. This type of operation resulted in the development of special techniques and tactical formations to minimize danger to dismounted personnel (Figure G-8). Once the minesweep was completed, the security element either escorted the convoy or positioned itself where it could act as a ready reaction force (RRF) if the convoy were ambushed.

(c) Security was also provided to land clearing companies and engineer projects such as road construction parties. Attached armored engineer platoons were organized and equipped to provide their own security; however, occasionally they had to be augmented by other combat elements in areas where there was a significant enemy threat.

(d) Security of squadron FSB was normally accomplished by positioning one or more platoons in the FSB at night, and positioning units where they could serve as a RRF for the FSB during the day. The tank company was commonly used in this role.

(e) Security of populated areas was accomplished by active and passive means. The regimental mission of protecting the populated areas of An Loc and Loc Ninh in Binh Long Province during January and February 1970 was accomplished by establishing night ambush patrols and strong points on the outer edge of the rubber plantations surrounding these areas, and by performing reconnaissance during the day.

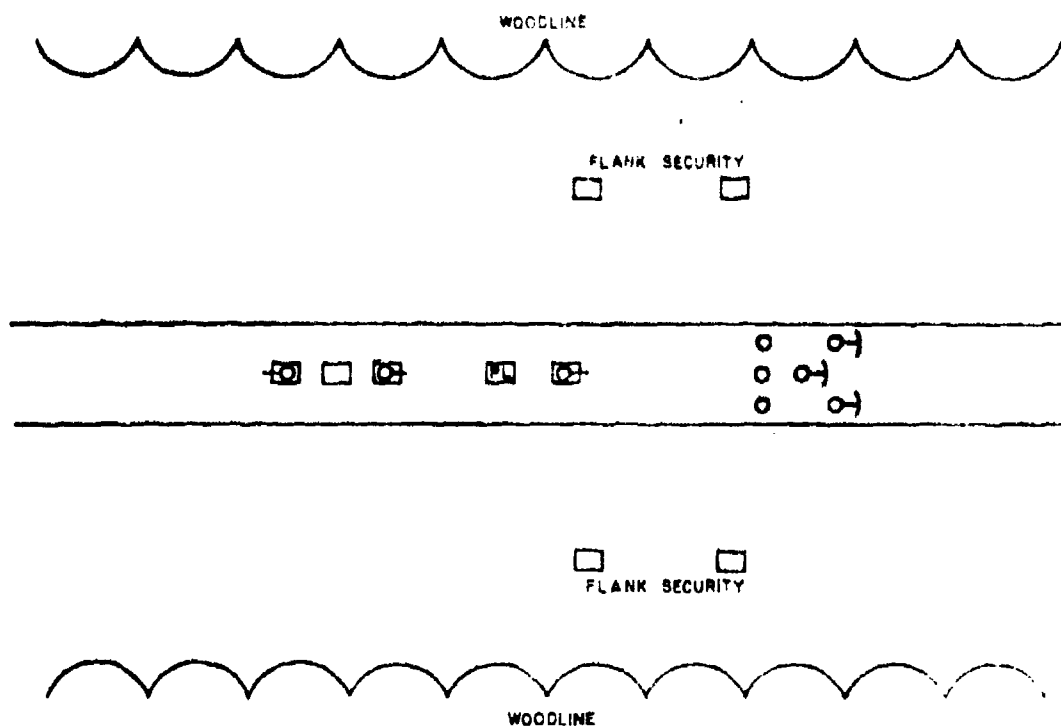
## (3) Tank Company Employment

Tank company employment did not differ significantly from doctrine; however, several minor variations emerged. One squadron, due to its large AO, assigned a separate AO to its tank company in which the latter conducted reconnaissance missions similar to the squadron's cavalry troops. The other squadrons generally employed their tank companies in security missions, for RRFs, and/or for "pile on" operations, an application of the principle of mass. Commanders estimated that the tank companies were employed about 30 percent of the time for "jungle busting" and about 5 percent of the time for "thunder runs" (a tactic of mine detection). Line formations were used infrequently due to the need for all-around security and because of the mine threat. As with the cavalry troop, the double and triple column and the box formations were frequently used to provide security.

## (4) Night Operations

All squadrons moved elements at night when the situation dictated; however, this was not a standard practice. Commanders generally believed that night cross-country movement by an armored column could not be covert. As a result, all types of illumination such as headlights,

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**LEGEND:**






-  M851
-  ACAV
-  PLATOON LEADER
-  DETECTOR OPERATOR
-  PROBER/DISMOUNTED SECURITY

FIGURE G-8 (U). Cavalry Platoon Minesweep Formations.

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natural moonlight, offset flares, and even searchlights were utilized. Night movement was conducted on approximately 5 percent of the nights. Movement was generally restricted to reaction and deception (estimated 20 percent), or completion of a daylight move (80 percent). The most commonly used offensive night operation was the strong point. A strong point was essentially a mounted ambush consisting of from three vehicles to a full platoon. Composition varied from tanks only to mixes of cavalry platoon elements. The purpose of the strong point was to provide area denial, security of fixed or semi-fixed installations, a RRF for dismounted ambush patrols, and for show of force. The normal method of establishing a strong point involved two basic techniques. The first consisted of the movement of a larger mounted element through or near the intended location of the strong point, leaving the strong point elements at the prescribed location. This was a deception technique masking the movement and location of the strong point. The second consisted of movement of strong point elements under cover of indirect fires to mask the sound of their movement. Typical strong point formations are depicted in Figure G-9. Each troop and tank company normally deployed at least one strong point per night. Dismounted ambush patrols were not used frequently due to the threat of engaging an entire NVA unit, company size or larger. The only dismounted elements normally were local security listening posts (LPs).

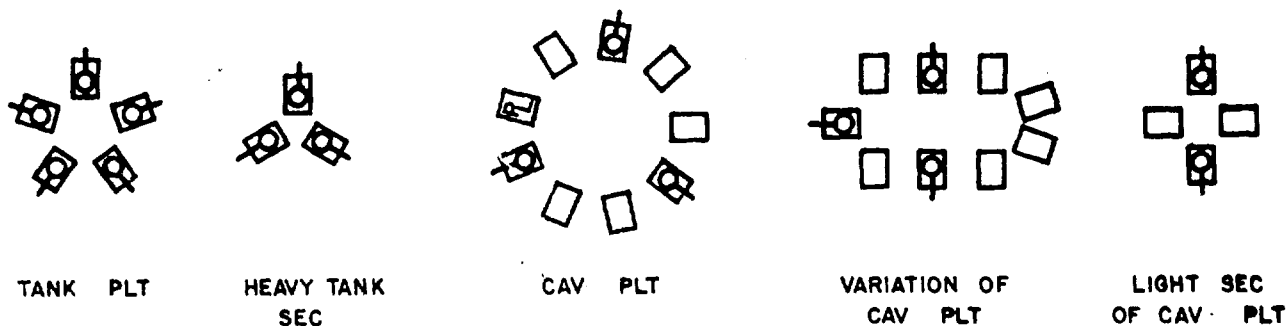


FIGURE G-9 (U). Strong Point Formations.

## (5) Artillery Raids

Artillery raids were commonly used. Batteries were habitually collocated with the squadron headquarters, generally near the center of the squadron AO. At the time of the evaluation, 50-90 percent of the squadron AOs were within range of organic howitzers. The enemy habitually located his forces just outside artillery fans. Artillery raids were usually conducted by moving two or three howitzer sections accompanied by necessary command, ammunition, FDC, and security vehicles to new positions from which fires on precleared areas could be delivered outside of the normal fan.

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## d. Enemy Contact

The level of conflict throughout the data collection period was low. The squadrons averaged enemy contact on only 1 out of 5 days during the 40-day evaluation period. Of these contacts, 50 percent were squad size or less, 20 percent platoon size, 10 percent company size or greater, and 20 percent were indirect fire attacks. Unit sizes were equated to equivalent US type units. On the average, four enemy personnel were killed in each contact. The most serious continuing threat was antitank mines. Of those encountered, 65 percent were detected, primarily by visual means; the remaining 35 percent caused vehicle damage, mostly minor. An average of 0.7 mines were encountered daily by each squadron; 39 percent of these had been planted in the jungle and in rubber plantations and the remainder on roads. About 65 percent of the mines encountered were of the Soviet T-46 variety. RPG incidents were infrequent during the evaluation period.

## 2. (C) ORGANIZATION

### a. General

#### (1) Introduction

The organizational problems encountered in the ACR are documented in this paragraph. Included herein are only those issues on which there was substantial agreement among the commanders and others interviewed. There is a necessary correlation between organization and equipment. Where an organizational problem has an implied equipment impact, the latter is concurrently discussed. On the other hand, purely quantitative equipment problems are discussed in paragraph 3, and the qualitative aspects of the equipment are discussed in Annex N.

#### (2) Organizational Mix

The organizational mix of the regiment is discussed in paragraph 2b. All commanders interviewed were satisfied with the mix of subordinate elements in the squadrons.

#### (3) The Army Authorization Document System (TAADS)

Commanders were queried as to their opinion on the adaptability of TAADS in stability operations. The current system for MTCF changes was described by all as unresponsive. The main defects were that it took too long to get approval of changes, and decisions were made at too high a level. There was considerable confusion within the ACR as to which documents were in effect.

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## b. Regimental Headquarters

Organizational problems existed at the regimental level in two areas: administration and logistics, and fire coordination.

### (1) Administration and Logistics

#### (a) General

Doctrinally, the ACR is expected to receive support on an area basis from the FASCOM Corps Support Brigades. This concept presupposes that the regiment will move frequently within the corps or field army zone. This was not the case in RVN. The regiment operated much like a separate light infantry brigade in fairly fixed AOs. During the evaluation, the regiment was under the operational control of another headquarters, but it was administratively and logistically separated.

#### (b) Regimental Administrative and Logistical Control and Support

1. At the time of the evaluation, the regiment had administrative and support elements attached as shown in Figure G-10. These attachments were supported in a variety of ways. The regimental HHT operated four instead of two messes. The regimental S1 provided administrative support to these units in addition to his regimental functions. His staff section performed numerous additional activities that would normally be accomplished by the administrative company in the support battalion of a separate brigade. The regimental S4, who was not a logistics operator, was incapable of providing logistical support for these attachments. Most of these units maintained their own property books, were partially satellited on a regimental element for maintenance, mess, and expendable supplies, and were required to draw supply point distribution items from the area supply and service battalion.

2. An allied problem was the requirement to maintain and secure the rear base camp. In larger organizations, this task was accomplished in part by the support units. Without organic support elements, the regiment was forced to create a provisional organization to provide for the operation and defense of the regimental base.

3. The problems discussed above were alleviated to some extent by higher headquarters which provided the regiment with personnel excesses. At the time of the evaluation, regimental HHT had an assigned excess of 24 officers and 123 enlisted men. In addition, the organic elements of the regiment were also used to provide security and administrative and logistical support for the attachments.

#### (c) Direct Support Maintenance

The ACR received maintenance support from the 185th

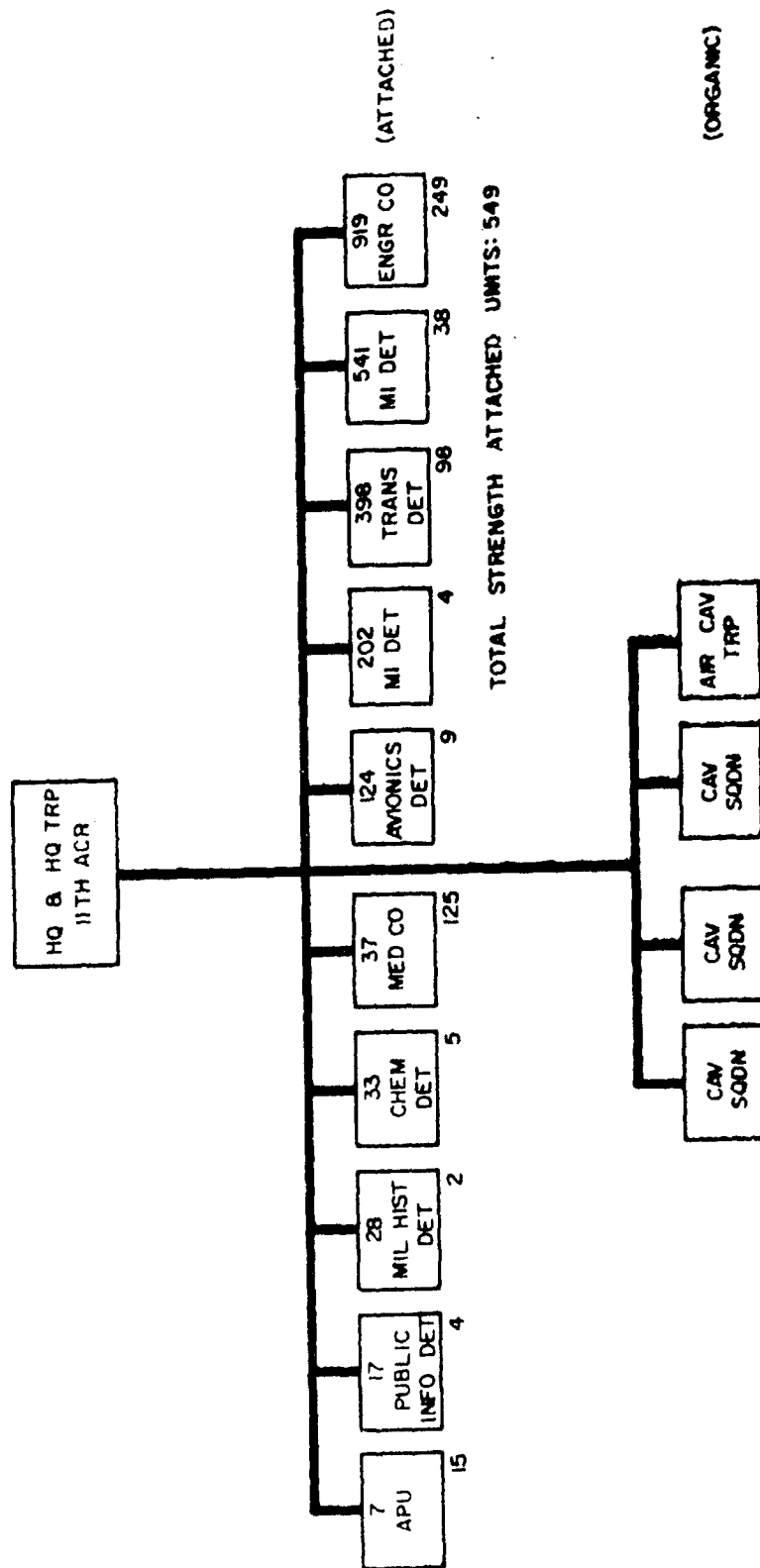


Figure G-10 (U). Administrative and Support Organization, 11th ACP.

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Maintenance Battalion (DS), which was based in Long Binh, a distance of 131 km from the forward support area (FSA). The 185th positioned a contact team of 30 personnel from the 135th Maintenance Company (LEM), a subordinate element of the 185th, at Quan Loi along with an eight-man team from the 185th's technical supply section. The contact team and the supply element provided limited DS maintenance and repair parts support. The capability of the DS element included automotive, turret, electrical, artillery, and communications equipment repair, as well as repair parts supply. The team also provided limited evacuation and retrograde of end items and assemblies. The logistics support requirements of the ACR exceeded the limited capabilities of the contact team, and the distance between the designated DS unit and ACR reduced response time to an unsatisfactory level. The lack of sufficient dedicated support to the ACR complicated command solutions.

### (d) Supply Support

The regiment received Class I, III, and V supplies at its FSA in Quan Loi. Other classes of supply were drawn from supply points at Long Binh (266th Supply and Service Battalion). Because of LOC security and supply point processing requirements, a round trip from Quan Loi required 2 to 3 days. Each major organic element of the regiment and most attached units had supply accounts in Long Binh. Some of the attachments were satellited on the regimental headquarters troop for certain supply point actions; however, the ACR had no centralized control element to coordinate supply actions for the regiment as a whole.

### (e) Users' Views

The regimental commander stated that an organic tailored support battalion would greatly enhance regimental administrative and logistical efficiency, as well as provide for the command and control of rear area operations. This suggestion would formalize the situation that existed. This organization, as a minimum, should provide the same support capabilities as those provided by the support battalion of a light infantry brigade.

### (2) Regimental Fire Support Element (FSE)

(a) An organic FSE in regimental headquarters was considered a mandatory requirement. The FSE would obtain clearances, coordinate available fires, post air advisory data, and provide fire support advice to the commanders. The problem of providing advice on fire support was not unique to RVN operations; however, it was compounded by the relative lack of experience of battery commanders, caused by rapid promotions. Problems with fire support planning and clearance of fires were complicated by having 360-degree zones of fire. Within the ACR AO, fire support was available from organic, division, II FFV and ARVN artillery, gun ships, and tactical air.

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(b) At the time of the evaluation, fires were cleared by a II FFV artillery battalion located near the regimental headquarters. II FFV Artillery also provided one LTC and three CPTs to assist in planning and clearing fires. These officers were augmented with regimental personnel and equipment, which degraded the resources of the squadrons' organic howitzer batteries. These personnel were rotated every 4 - 8 weeks, which resulted in a lack of continuity. USARV recommended approval and had forwarded an MTOE change which would authorize an artillery FSE at regiment to fulfill the requirement discussed above. The lack of an organic fire support element to plan, coordinate, and clear fires in support of the regiment was considered a major organizational problem. In addition to this problem, there was the lack of artillery liaison sections at squadron level. This related problem is discussed in paragraph 2c(1) below.

## (3) Regimental Staff and HHT

No apparent significant organizational problems existed with the regimental staff or HHT other than those discussed above.

## c. Squadron Headquarters

### (1) Squadron Command and Control

#### (a) Regimental - Squadron Interface

Other than those problems discussed above, there were no significant interface problems between the regiment and the three squadrons.

#### (b) Helicopters

Each squadron was authorized two OH-6 and two UH-1 helicopters. These aircraft were used primarily for command/control and reconnaissance, with secondary administrative and logistical uses. The squadron commander normally employed one UH-1 helicopter exclusively for command and control. While airborne, he was generally accompanied by his Command Sergeant Major, and on occasion by the artillery LO. The S3 normally used one OH-6 for control and reconnaissance. The squadron assistant S3 habitually used a helicopter for courier runs to deliver operations orders and other classified documents. Maximum administrative and supply use was made of the squadron helicopters when they were required to return to the FSA for refueling. An average of 12 hours "blade time" was recorded by the squadron flight section daily. This unique organic asset provided a tremendous capability to the squadrons and gave them a flexibility not enjoyed by other armored or mechanized units in RVN.

#### (c) Command ACAVs

Two of the squadron commanders rarely used their command



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ACAVs as command vehicles due to the environment and unit dispersion, while the third used his an average of 1-1/2 hours per day. Other uses of the command ACAVs are discussed in paragraph 2d(2), below.

### (d) Communications Equipment

In general, all squadron commanders considered the authorized communications equipment to be adequate for command and control. The one major exception was the AN/VRC-12 authorized in the command ACAV. With the requirement to operate in several nets simultaneous, a single radio was inadequate. This problem is discussed further in paragraph 31(2), below.

### (2) Fire Support Coordination

The basic problems inherent with the fire support functions for the regiment also applied to the squadron. There was no supporting artillery liaison element available to the squadron to plan, coordinate, and clear available fires for support. This function was performed within squadron resources, and was considered unsatisfactory.

### (3) Unit Location

Control of subordinate units was complicated by the difficulty in determining precise locations in the jungle. Navigation by terrain features was almost impossible. This problem was compounded by the inability of commanders to obtain an accurate compass reading without error induced by the metal mass of their vehicle. Several techniques were devised to overcome this problem. Multiple compass readings were taken by different vehicle commanders and averaged. Another technique was to use a compass reading, along with the mileage traveled, to obtain a rough indication of location then plotted on a map from a known starting point. This was a crude method, since accuracy was affected by the number and length of detours made to avoid streams, bogs, heavy trees, bomb craters, and other obstacles, and errors in conversion of miles, obtained from the vehicle odometer, into meters. Other more accurate methods used were air spots and use of artillery marking rounds. A majority of unit commanders interviewed indicated a requirement for a dependable vehicular-mounted compass.

### (4) Staff Functioning

(a) Every squadron operated a forward TOC in the field and a CP in the FSA at Quan Loi. The squadron S3's were located in the forward TOC and functioned as deputies for operations and maneuver. The S2 and S3 sections coordinated operations from the forward TOC. In the absence of the S3, the S3 Air, who functioned as an assistant S3, supervised TOC operations. When available, liaison officers assisted in TOC operations.

CONFIDENTIAL

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(b) Squadron executive officers functioned as deputies for administration and logistics and supervised all squadron elements in the FSA. Administrative and logistical activities were controlled from the FSA. The S1 and S4, along with their respective sections, were normally located there. The property book officer of each squadron remained in the rear area, which slowed support coordination. The multiple CP requirements stretched authorized staff personnel to the limit.

(c) The S5 assumed an increasingly important role in operations in RVN. The S5 was used for MEDCAPS, ICAPS, liaison, and coordination of local pacification projects. The S5 section was authorized one captain. This was considered inadequate and had been augmented from organic resources. Two commanders stressed the fact that the S5 required a section consisting of no fewer than two, preferably three, people with organic transportation and radios.

## (5) Dispersion and Rear Area Requirements

Each of the squadrons maintained a rear echelon at either the regimental base camp in Bien Hoa or in Di An. An average of 15 percent of HHT and 4 percent of the cavalry troops, tank company, and howitzer battery of each squadron were in these locations. The next echelon forward was in the regimental FSA in Quan Loi. An average of 48 percent of each HHT and 9 percent of the troops, companies, and batteries were located at the FSA. The balance of the personnel were located in the respective squadron AOs, up to 30 kilometers away from the FSA. These figures do not include personnel absent for administrative reasons. The dispersion of personnel resources was accompanied by a corresponding dispersion of equipment needed for support and security, which further reduced combat capabilities. This dispersion of personnel and equipment was a normal occurrence in RVN, and contributed to certain equipment and organization problems of the regiment.

## (6) Liaison

All of the squadron commanders indicated that their liaison organization was adequate and that no changes were necessary. Throughout the evaluation the regiment was situated in the relatively sparsely populated Binh Long Province. Most of the required liaison with Province/Sector and with major ARVN units was accomplished by regimental headquarters. Only during combined operations were the squadrons required to place a full-time liaison officer with ARVN units. Periodic liaison was easily accomplished with organic aircraft. This was in contrast to other types of armored units, which did not have organic aircraft.

### d. Headquarters and Headquarters Troop (HHT)

#### (1) Command and Control

Command and control of HHT presented no organizational problems.

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however, the HMT CO had the usual problems of any headquarters commander. He was primarily responsible for squadron FSB security. Additionally, he controlled the miscellaneous ACAVs in HMT both for security of the base and for special missions received from squadron. The HMT XC and first sergeant remained with the elements of the troop located in the FSA.

### (2) Combat Support Elements

#### (a) Mechanized Flamethrower Section

Each squadron was authorized three M132A1 mechanized flamethrowers and three XM45E1 (M548-mounted) service units. All authorized M132A1's were on hand; however, the three squadrons collectively had been issued only a total of four service units. Since there were no additional XM45E1 service units in theater for issue, the M4A2 (truck-mounted) service unit was scheduled to be issued in lieu of the XM45E1. The M4A2 service unit was unanimously considered to be an inadequate substitute, since it could not accompany the M132A1 cross country. Additionally, it has only one-half the load carrying capacity of the XM45E1. The flame tracks and service units were retained under squadron control, and attached to troops on a mission basis. Typical missions for this section included clearing brush in Rome Plow cuts, clearing jungle, burning brush to improve fields of fire, and neutralizing bunkers. During the evaluation the M132A1 was utilized by all squadrons on an average of every fifth day. Low employment resulted from unavailable or inoperative track-mounted service units. All commanders indicated that the flamethrower was a valuable addition to their unit and that they were satisfied with the basis of issue (BOI). However, there was an apparent error of omission in the MTOE because the M132A1's had not been authorized radios. In two squadrons, AN/VRC-53 radios were installed. In the third squadron, AN/VRC-46 radios had been installed. The MTOE was considered in error, since AN/VRC-46 radios were authorized in the M132A1's in the mechanized infantry battalions. All agreed that these vehicles required communications, preferably with the AN/VRC-46.

#### (b) Ground Surveillance Radar Section

Each squadron was authorized ten AN/PPS-5 radars: two in each cavalry troop, two in the tank company and two in HMT. The number of squadron radars on hand is shown in Figure G-11. In most cases, AN/PPS-4 radars were issued in lieu of AN/PPS-5 radars. Two of the squadrons employed their radars under troop/company control. The third squadron had centralized all radars at squadron level and attached operational radars to each troop and company. Maintenance training and employment responsibilities were retained by this squadron. Occasionally, squadrons were required to hand-receipt radars to the regimental headquarters, which in turn hand-receipted them to the 1st Cavalry Division, Airmobile. Figure G-12 portrays the location and controlling headquarters for the radars. While each squadron averaged five to six operational radars, only one to three were generally employed at a given time. No radar plans were prepared by the squadron. Commanders were

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UNIT	PPS-3		PPS-4	
	AUTH	O/H	AUTH	O/H
1/II CAV	10	1	0	8
2/II CAV	10	2	0	7
3/II CAV	10	1	0	7

FIGURE G-11 (U). Radar Equipment Authorized and On-Hand.

UNIT	LOCATION OF RADARS			HQ CONTROLLING EMPLOYMENT & SUPPORT	
	CONSOLIDATED AT SQDN	TROOP	HAND RECEIPT TO RGT/CTY	SQDN	TROOP
1/II CAV		X	X/1		X
2/II CAV		X	X/2		X
3/II CAV	X			X	

FIGURE G-12 (U). Location and Control of Radars.

not enthusiastic about radar, due to several problems associated with its employment. The AO of the regiment at the time of evaluation was considered marginally suitable for radar. The minimum range of the AN/PPS-4 radar was 30 meters; however, in an estimated 89 percent of the AO, visibility was less than 100 meters because of thick vegetation. Only 25 percent of the assigned radar operators were school trained. Repairs required an average of ten days. As a result, other simpler detection devices, such as starlight scopes, were preferred and employed. Effectiveness of the radars was described as poor, unknown, or limited. Targets detected by radar were engaged; however, subsequent sweeps of the target areas indicated no positive results, which further degraded user confidence. Squadron commanders felt, however, that the basis of issue of radar equipment was satisfactory even with these problems. This was based on an employment potential for the equipment and occasional satisfactory results. Generally speaking the three squadrons employed radars in NDPs (64 percent), at CPs (22 percent), ambush patrols (4 percent), and other missions (10 percent of the time).

G-20

# CONFIDENTIAL

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## (c) AVLB Section

The AVLB section operated under squadron control and supported cavalry troops and the tank company on a mission basis. The size of the launcher and bridge presented problems when operating in jungle areas not cleared by preceding vehicles. The increased clearances required for turns became critical when traveling through rubber plantations. When supporting cavalry troops during the wet season, the AVLB occasionally became mired down or caused roadways to cave-in due to its great weight. As a result, commanders expressed an interest in the development of a lighter bridge with better trafficability and the capability of supporting all vehicles in a cavalry troop. All commanders thought the AVLB was a valuable asset, and wished to retain this section as currently organized. The squadrons used one or more bridges on an average of 28 percent of the days in the evaluation period.

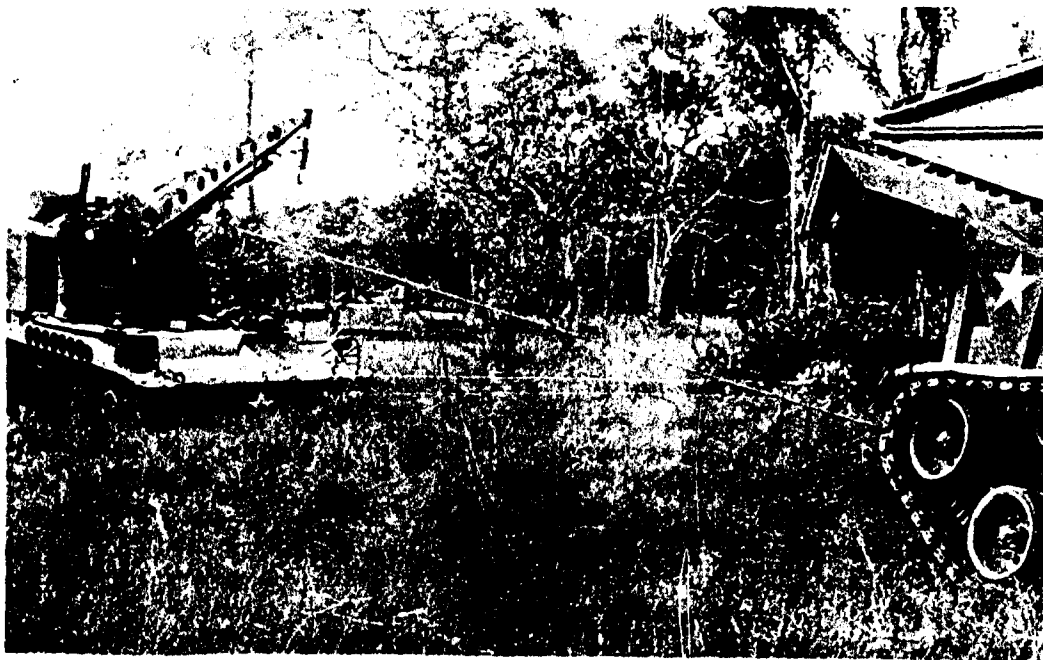


FIGURE G-13 (U). Recovery of Mired AVLB.

## (d) HHT M113A1 APC/ACAVs (Provisional Combat Sections)

The squadrons had formed provisional combat sections from HHT command, combat, and combat support vehicles. These sections

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were intended to perform limited economy-of-force missions such as security for MEDCAPs, LZs, water points and work parties, as well as to serve as a reaction force. Figure G-15 indicates the composition of these sections at the time of the evaluation.

## (a) Air Control Team

The air control team as authorized by the MTOH was not used for its intended function by any squadron. Personnel were absorbed by expanded operations sections and the ACAV was used elsewhere.

## (3) Combat Service Support

### (a) Support Platoon

#### 1. General

Squadrons drew Class I, II, and III supplies at the FSA in Quan Loi. All other classes of supply were drawn at Long Binh Depot and transported on support platoon and troop trucks to the FSA, a distance of 131 kilometers. From the FSA a vast majority of resupply and other services were provided to the units in the forward area by air - an average of 40 tons a day. Commanders estimated that over an extended period of time, 70 percent of their resupply had been by air. The authorized vehicles of the support platoon consisted of two 5000-gallon tankers, eight 5-ton tracked cargo carriers (M548) and fifteen 5-ton trucks (M54). The support platoon, as organized, was considered more than adequate to support this type of resupply operation. Since the support platoon operations terminated at the helicopter pad in the FSA, the platoon transport assets exceeded requirements, and one M548 was released to each troop and company. In general, wheeled vehicles were not taken to the forward areas.

#### 2. Resupply Methods

##### a. Class III Resupply

Squadron support platoon personnel delivered bulk POL by 5000-gallon tanker to the squadron FSA helicopter pad, where they filled 500-gallon collapsible fabric drums. The drums were delivered by helicopter to the troop/company landing zones. The supply normally consisted of one 500-gallon drum of diesel to each troop and tank company daily and two 500-gallon drums daily to the squadron M113A1 battery. M26A3 was normally delivered weekly, one 500-gallon drum for each M26 recovery vehicle and ten 55-gallon drums for the squadron M113A1 battery. The drums were either lifted by an M26 or M28 or placed on the deck of a M113A1, and vehicle fueling was accomplished by gravity feed. The drums were also pressurized by driving vehicles over them or by squeezing them between two vehicles. None of these methods were satisfactory since they either tied up the recovery vehicle during refueling operations or they resulted in damage to the drums. When available, fuel transfer pumps

G-1

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were used. All commanders stated a requirement for two fuel transfer pumps per troop/company, with additional backup pumps in HHT. Use of pumps would release the M578 and M88 for their intended role of maintenance and recovery. Other squadron Class III delivery equipment was diverted to water resupply; for example, the second 5000-gallon tanker delivered water in the FSA.

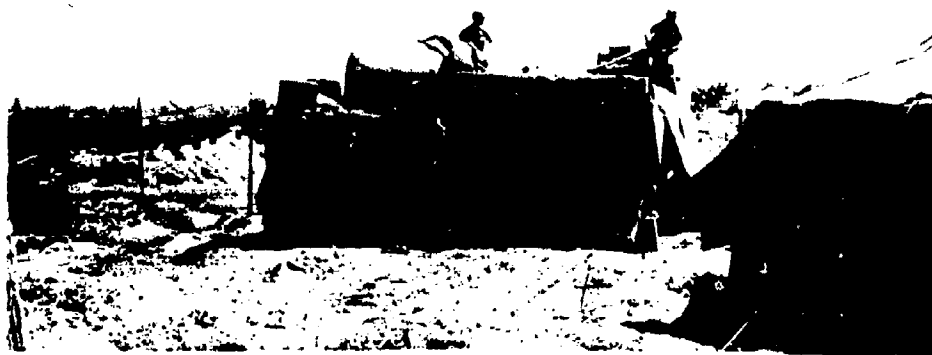


FIGURE G-14 (U). Use of 500-Gallon Drum on M113A1 Carrier for POL Resupply.

### b. Class V Resupply

Ammunition was transported the short distance from the ASP in the FSA to the squadron helicopter pad by 5-ton trucks. Support platoon personnel rigged the ammunition for air transport to troop/company LZs by helicopter. Aside from the vehicle basic loads and on-ground howitzer ammunition, other Class V was seldom stocked in the forward area.

### c. Water Resupply

Water resupply was accomplished using essentially the same procedures for POL resupply. Air-delivered drums were used to fill one of the unit water trailers, which normally stayed in the forward

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command post (CP) or defensive position (NDP). The second trailer remained in the FSA. This system was used because several trailers had been damaged or dropped when carried by helicopter. When possible, the regimental engineer company set up water points in the field to provide potable water.

## (b) Maintenance Platoon

### 1. Organization

In general, commanders felt that the maintenance platoon organization was adequate to support operations. In two squadrons approximately two-thirds of the platoon was habitually located at the FSB. The remaining third was in the FSA. In the third squadron this ratio was reversed. Each squadron maintenance section had acquired an excess M109 shop van which was used as a mobile shop office to maintain maintenance and supply records, regulations, and publications. All those interviewed thought one such vehicle should be added to the platoon MTOE.

### 2. Personnel

Generally, personnel interviewed were satisfied with the current MTOE authorization for personnel. However, in all cases there was concern about the qualifications of available personnel. It was felt that replacement mechanics, although school trained, were not capable of performing maintenance on the unit vehicles and had to undergo excessive training after arriving in the unit. This was particularly true of turret mechanics. Also, very few replacement mechanics or motor sergeants had M551 AR/AAV experience.

### 3. PLL

All squadrons had consolidated the storage of troop and company PLLs under squadron supervision in the FSA. Except for bulky items, the PLL was stored in unauthorized 6-ton expandable trailers. Although the equipment was physically centralized, separate troop and company PLL registers were maintained. It was considered that this centralized control and consolidated storage enhanced efficiency. The availability of air assets was a major factor which made possible the centralized supply operation.

## (c) Medical

### 1. Organization

The comments contained in paragraph 3b(2)(b), Annex B apply.

### 2. Equipment

While 95 percent of medical evacuations were by air,

G-24

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commanders still considered valid the requirement for a medical evacuation vehicle to accompany each maneuver element. Each squadron was authorized three such vehicles; however, the tank company constituted a fourth maneuver element. As a result, all commanders felt that a fourth tracked ambulance was required. This conflict was resolved by diverting the tracks indicated in Figure G-15 for use by aidmen in the tank company. Most of these vehicles were equipped with excess ACAV kits. All commanders felt strongly that these vehicles required the M113A1 Armament Subsystem "A" for self defense. The MTOE did not provide any armament subsystem for these vehicles.

### (d) Communications Platoon

#### 1. General

a. The communications platoon concerned itself primarily with the repair of equipment and management of radio and telephone communications nets. In all units, it was felt by commanders and communications officers that the level of repairs authorized to be performed by the platoon was too low. In all cases the amount of time normally required for repairs by DS maintenance elements was thought to be excessive. Generally, the units conducted some higher level repair with authorized personnel using unauthorized test equipment and repair parts. The authorization of additional personnel, equipment, and a higher level of repair at unit level was the solution preferred by most persons interviewed on this problem.

b. Wire communications were seldom used [See paragraph 3c(1)(d)3, Annex B].

#### 2. Personnel

All personnel interviewed stated that the communications chiefs at both troop and squadron level should be one grade higher to make the rank more nearly commensurate with the responsibility and skill level required. With the low usage level of wire for communications, half of the personnel interviewed stated that the three messengers who carry wiremen MOSs should be replaced by radio repairmen. This was based on the premise that the repairmen were capable of performing either job, while a wireman rarely could be used for even the most elementary radio repairs. Two wiremen were considered sufficient to man the forward CP switchboard.

#### c. Armored Cavalry Troop

##### (1) Organization and Operations

The basic organization of the cavalry troop was not substantially changed by the MTOE. All troops maintained a rear detachment in either Bien Hoa or Di An with approximately four percent of their personnel, another detachment at the FSA with approximately nine percent of their personnel, and the remainder of the personnel were located in the forward area.

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VEHICLE LOCATION	ACTUAL EMPLOYMENT											
	1/11 CAV				2/11 CAV				3/11 CAV			
	MTOE AUTH	HHT SECURITY SEC (PROV)	GND SURVL SEC	MECH FLAME SEC	HOW BATTERY	MED EVAC SEC	HHT SECURITY SEC (PROV)	GND SURVL SEC	MECH FLAME SEC	HOW BATTERY	MED EVAC SEC	
SQDN CO	1	1					1					
SQDN S-3	1	1					1					
SQDN LNO	1	1					1					
AIR CONT TM	1	1								1		
GND SURVL SEC	2	1			1		1		1		3	
MED EVAC SEC	3				3							
MECH FLAME SEC	3 *		3 *					3 *			3 *	
EXCESS MI3AI										1		

\* W120A1 Flame Vehicles. When not employed in primary role, the flame sections were used to augment the HHT security section (provisional).

Figure 7-15 (1). Actual Employment of HHT M113A1 and M113A1 Vehicles, Armored Cavalry Squadron, ACP.

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Each troop established a CP, normally located near the center of its assigned AO. This was displaced every 2 - 3 days. The CP also served as the NDP and the service support area for the troop. Located in the CP were the troop M577A1, the M113A1 maintenance track, the M578 LTR, the M548 attached to them from the support platoon, the M106A1/M125A1 mortar tracks (in two squadrons), and, when not with the troop commander, the radar, medical, and FO M113A1 APC/ACAVs. At night the entire troop, less elements conducting ambushes, would laager in the CP area. Generally, each troop returned to the FSA once every 4-6 weeks for a 2-3 day maintenance standdown.

### (2) Command and Control

(a) Troop commanders spent most of the daylight hours in their command ACAVs. Exceptions to this were when platoons were employed for diversified missions, such as multiple road sweeps or convoy security, at which time the troop commander operated from his CP. The troop M577A1 proved invaluable as a command post, operations center, orderly room, and a central point for coordinating resupply.

(b) It was commonly felt that the quantity and types of radios authorized for command ACAVs were inadequate for effective command and control, [See paragraph 31(2), below].

### (3) Platoon Tank Sections

All cavalry platoons in the regiment had been equipped with the M551 AR/AAV for at least five months prior to the evaluation. The M551 replaced the M113A1s which were previously authorized by MTOE for the platoon tank section. This change realigned the cavalry platoons of the 11th ACR to the traditional cavalry configuration. Almost without exception, commanders and troop personnel were pleased with the consequential increase in firepower.

### (4) Infantry Squad

All commanders felt the need to have complete crews on the ACAVs was greater than the requirement to have an intact infantry squad within the platoon. The infantry squad as such, therefore, was not found within the cavalry platoon. Rather, all MOS 11B personnel in the platoon were distributed among all the scout ACAVs, and the infantry carrier became an additional scout vehicle. All units did, however, attempt to maintain a dismounted capability by using one to three personnel for each ACAV as required. It was estimated that the infantry was dismounted approximately four percent of the time. In general they were dismounted because they were the only troops available or because of trafficability limitations. Dismounted elements seldom operated further than 100 meters from the ACAV. More often they were within 25 meters of the vehicle. When dismounted, at least two individuals remained on the vehicle, the driver and a (caliber .50) machinegunner. Approximately 40 percent of the ACAV crewmen carried the infantry MOS 11B. Commanders, however, considered that this

G-27

## CONFIDENTIAL

CONFIDENTIAL

induced training problem could be overcome by OJT as long as a large influx of MOS 11B personnel was not received at one time.



FIGURE G-16 (U). Scout ACAVs Supporting Dismounted Crewmen by Fire.

(5) Platoon Mortars

There were no significant problems in organization and employment of the mortars which could not be overcome by tailoring assets to meet the requirements of each tactical situation. The regiment was in the process of converting from 4.2-inch to 81mm mortars. Squadron commanders differed in their opinions as to which mortar was better suited and how they could be employed most effectively. Two commanders thought the mortars were best consolidated at troop level to facilitate security, clearance procedures, and massing of fire to increase responsiveness and to ease ammunition resupply. The third commander had consolidated all his mortars into a provisional battery under squadron control. This had the additional advantages of enabling the squadron to integrate mortar fires more readily with those of the howitzer battery. It had the disadvantage, however, of not being able to provide mortar coverage for all the troops in the large AOs. During the evaluation period, the three squadrons utilized 81mm fires 75 percent of the days and 4.2-inch mortar fires 85 percent of the days.

G-23

CONFIDENTIAL

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## (6) Troop Combat Service Support

No significant organizational problems were noted in the troop combat service support elements. Support personnel were split between the troop field CP location and the FSA. Those elements in the FSA were controlled by the troop executive officer. Cooks were sent to the field daily from the FSA with the prepared evening meal and rations to prepare for breakfast the following morning. The troop maintenance section performed limited repairs in the troop CP area. Needed repair parts were delivered by air from the FSA, although a few high-demand parts were carried in the M113A1 maintenance vehicle. Equipment which could not be repaired at the troop area was evacuated. Troop resupply in the field was as explained in Paragraph 2d(3), above. **The M548 tracked cargo carrier, attached from the support platoon, was considered "nice to have" but none thought that it was a permanent requirement.**

### f. Tank Company

#### (1) Organization and Operations

The basic organization of the tank company was not substantially changed by the MTOE. Dispersion of the tank company in the rear base and FSA, and establishment of a field CP were generally accomplished in the same manner as in the cavalry troops. Squadron commanders frequently collocated the tank company with the squadron CP. None of the squadron or company commanders thought any reorganization in the tank company was required, except as noted in paragraph (3) below. In the past, it had been suggested that the tank company be organized with five 3-tank platoons for stability operations. The unanimous opinion of the commanders in the regiment was that the current organization was adequate and that such a modification would degrade the operational capability of the tank company and generate serious control problems. Another suggestion was to replace one of the tank platoons in the company with one mechanized infantry platoon. Unit commanders did not like this, as one of the major roles of the tank company was reinforcement of the cavalry troops, **and to accomplish this mission the maximum number of tanks were required.** While all agreed a dismounted capability was needed on occasion, it should not be obtained by reducing tank strength.

#### (2) Command and Control

(a) In all squadrons the need for a CP vehicle for the tank company commander was emphatically stated. All squadrons had in fact provided the tank company with an M577A1 from squadron assets. With the tank companies frequently operating for extended periods away from the squadron FSB, or even operating from the FSB, M577A1 command post vehicles became highly desirable. It was unanimously felt that this vehicle, with organic radios to monitor three nets (squadron command, company command, and artillery-using the AN/VRC-12 and AN/GRC-46) and a crew of two NCOs and

G-29

# CONFIDENTIAL

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an RTO/Driver, could provide the company with a needed 24-hour operational capability. The M577A1 command post vehicle would also provide a place for a responsive net control station, a field orderly room and, in general, take a great load of routine business out of the commander's tank turret.

(b) It was unanimously felt that both the quantity and type of radios authorized for command tanks were inadequate for command and control. [See paragraph 31(2), below].

## (3) Security Squad

All commanders interviewed stressed the desirability of adding an organic security squad to the tank company. The local security problems associated with tank elements in RVN were greatly increased over conventional operations. The need for dismounted elements to provide clearing patrols, security-type ambushes, observation and listening posts, and other security missions was apparent during the evaluation.

## (4) Company Combat Service Support

Comments pertinent to the armored cavalry troop were applicable to the tank company.

### g. Howitzer Battery

#### (1) Organization and Operations

The basic organization of the howitzer battery was not substantially changed by MTOF except for the deletion of the battery security section. Approximately 95 percent of the howitzer battery firing missions were in direct support of their squadron. Of these, about 60 percent were intelligence and interdiction missions, and 30 percent were contact missions. The preponderance of the contact missions were used to block enemy withdrawal from the contact area. The remaining 10 percent of the fires consisted of illumination, raids, and other miscellaneous missions. The batteries normally were located with the squadron CP to consolidate security and resupply requirements. The batteries displaced on the average of once every 2 - 4 weeks. Occasionally, the batteries were required to operate temporarily in two locations. During the evaluation the howitzer batteries provided cover for 50 to 90 percent of their parent squadron's AO.

#### (2) Command and Control

(a) The number of radio-equipped vehicles authorized the howitzer battery was considered inadequate, partially because wheeled vehicles were not suitable for service with armored cavalry units in RVN. Except for the FO APC/ACAVs, which normally operate away from the battery, there were only two tracked vehicles equipped with radios. All personnel interviewed thought the battery commander should be authorized a radio-

# CONFIDENTIAL

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equipped APC/ACAV. The stated purposes for which this vehicle would be used were control and security during displacement and as a temporary FDC when the battery conducted split operations. All squadrons had recognized this problem by providing the battery commander an APC/ACAV from squadron resources. The ACAVs were equipped with two AN/VRC-46 radios.

(b) Additionally, those interviewed thought that each M109 howitzer should be authorized an AN/VRC-53/64 radio for supplemental control in the FSBs and for control during movement. If the howitzer battery were to be ambushed on the move, the commander would have no direct way to control counter-ambush operations. Similarly, if a FSB were attacked, the radio would provide backup communications in the event of loss of the wire capability.

(c) The howitzer battery was authorized three FO teams to support the four maneuver elements of the squadron. All commanders thought that an additional FO team was required in the fourth maneuver element. A fourth FO team had been formed from excess personnel and equipment resources for the tank company. This FO normally rode in the bustle rack of the commander's tank, which was an unsatisfactory arrangement. The second tank in the tank company headquarters was not used by the FO because of its dozer blade configuration, other requirements for the vehicle, and lack of adequate communications.

## (3) Battery Combat Service Support

Battery support operated in substantially the same manner as the cavalry troop, except that ammunition resupply required commensurately greater effort, both in the field location and the FSA.

## 3. (C) QUANTITATIVE EQUIPMENT PROBLEMS

### a. General

The quantitative equipment problems encountered in the ACR are documented in this paragraph. Included herein are those subjects on which there was substantial agreement among the commanders and others interviewed. As an exception to this, certain background information is included for subsequent analysis of other issues. Other potential problem areas were addressed during the evaluation but were discarded after preliminary analysis indicated no justification for further examination. Equipment problems relating to organizational issues which were discussed in paragraph 2 above, are included in this paragraph for completeness and reference. The qualitative aspects of the equipment are discussed in Annex O. A list of MTOF-authorized equipment considered unnecessary is included in Appendix 3 to Annex C.

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## b. M113A1 APC/ACAV

Commanders expressed satisfaction with the quantity of M113A1's currently authorized, with three exceptions:

(1) An additional M113A1 medical evacuation vehicle was desired in the squadron medical platoon (paragraph 2d(3)(c), above).

(2) An additional M113A1 was desired for the howitzer battery commander (paragraph 2g(2)(a), above).

(3) An additional M113A1 was desired for the howitzer battery (paragraph 2g(2)(c), above).

## c. M48A3 Tank-Mounted Bulldozer

All commanders expressed a need for a dozer capability; however, the blade mounted on the M48A3 reduced the mobility and combat capability of the vehicle too much to compensate for the gain in dozer capability [See paragraph 3c(3)(b), Annex B]. Commanders expressed a requirement for an additional fighting tank (for a total of 18), which would permit the tank-mounted dozer to be a special-purpose vehicle. An alternate suggestion was to delete the dozer blade from the MTOE and provide a combat engineer vehicle in the MTOE of the attached armored engineer platoons. The latter was the preferred solution, and was feasible within current assets of the armored engineer company attached to the regiment.

## d. M577A1 Command Post Vehicle

An additional M577A1 Command Post Vehicle was desired for a tank company CP vehicle [See paragraph 2f(2), above].

## e. Recovery Vehicles

There were MTOE contradictions regarding actual authorizations for recovery vehicles. The MTOE summary document authorized two M578 LTRs and five M88 VTRs; whereas, the detail documents authorized the reverse. The squadrons generally had on hand five M578's and two M88's. Assuming the Detail MTOEs are correct, most commanders considered this authorization adequate. The determination of adequacy was complicated by the evolved resupply techniques, equipment usage, recovery operations, and equipment limitations. During the evaluation there were few reported incidents of recovery vehicles being used in their primary role. Recovery was generally accomplished with other combat vehicles. Since it was the dry season, little recovery was required - an average of one vehicle per squadron every second day. No commander expressed interest in having the M113A1 recovery vehicle, XM806E1 (ENSURE 56), because none had first-hand experience with the vehicle.

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### f. M548 Tracked Cargo Carrier

For the types of operations being conducted during the evaluation, personnel interviewed felt that the squadron had an adequate number of M548's.

### g. Wheeled Supply Vehicles

Each squadron considered the authorization of 2 1/2-ton and 5-ton trucks adequate. During the evaluation, these vehicles were under-utilized, due to heavy reliance on aerial resupply. Vehicle usage is described in paragraph 2d(3), above.

### h. Administrative Vehicles

There were excess administrative vehicles in regimental headquarters. Additionally, throughout the regiment most of these vehicles were used for functions other than those intended. Radios from these vehicles were generally removed and employed elsewhere. Because of fluctuating requirements and changed usage, it was impossible to evaluate this area accurately.

### i. Countermine/RPG Equipment

#### (1) General

The 11th ACR faced a severe mine threat on roads and from random emplacement of mines in the jungle and rubber plantations. All commanders interviewed stressed the fact that this posed the greatest threat to armored vehicles. Despite the fact that RPGs tended to produce more casualties, the frequency of encounter with RPG-armed enemy forces was less than the incidence of mining. Very few casualties and almost no fatalities resulted from normal-sized antitank mines, those weighing approximately 20 pounds.

#### (2) Countermine Equipment

Some individuals were interviewed who had had previous experience with vehicular-mounted mine rollers (ENSURE 202). They were unimpressed with this piece of equipment; however, all commanders stressed that some type of vehicle-mounted detector, roller, plow, or mine detonator was absolutely essential in this type of environment. They further stated that any mechanical device developed must be readily attachable, detachable, and easily repairable. Also it must be able to function reliably at a reasonable cross-country speed as well as on improved roads. All agreed that development should not be limited to mechanical detection and destruction devices. Since any mechanical device would probably have some limiting effect on the combat vehicle employing it, a nonmechanical device or munition was preferred.

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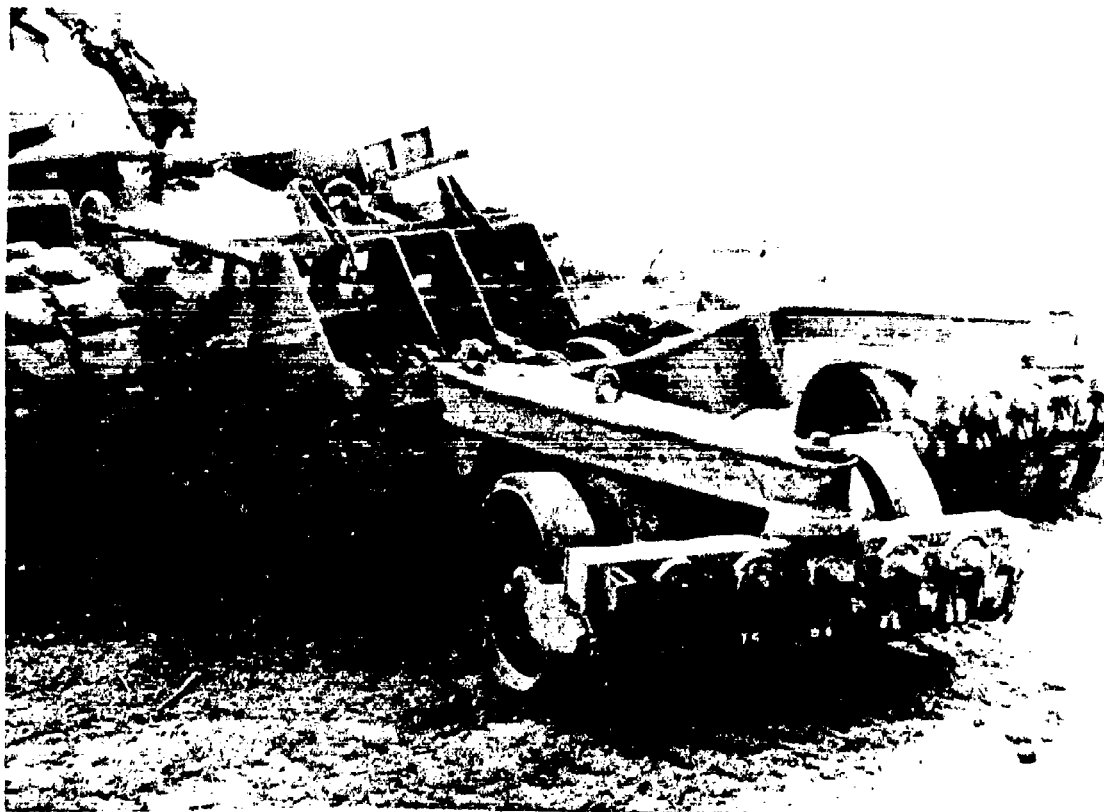


FIGURE G-17 (U). Track-Mounted Mine Roller (ENSURE 202).

(b) Commanders thought the MTOE authorization of 11 hand-held mine detectors per squadron was inadequate. A change in the quantity authorized was thought necessary for the following reasons: each squadron cleared an average of 24 kilometers of road daily, requiring employment of detectors on an average of 70 percent of the days during the evaluation period; a common technique of sweeping roads with three detectors simultaneously increased speed, thoroughness, and requirements for detectors; each subelement needed readily available mine detectors to counter the enemy tactic of random mining in the jungle and in rubber plantations; and the time required for DS maintenance repairs of detectors averaged 10 - 14 days. Because of these reasons, the average of the recommended changes in authorization would give ten mine detectors to each cavalry troop, five to the tank company, and three to HNT, for a total of 38 per squadron. No data on relative quantities of nonmetallic (AN/PRS-4) and metallic (P-153) detectors was obtained. It was stated that additional handheld mine detectors would provide a short-term solution. The longer-term solution desired was for reliable mechanical and nonmechanical detection and destruction devices associated with combat vehicles.

G-34

CONFIDENTIAL

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### (3) Belly Armor Kit for M113A1

As discussed in paragraph 2d(1), Annex B, belly armor was considered an excellent passive defensive measure against smaller antitank mines.

### (4) Counter RPG Equipment

The main passive RPG protection used by all armored vehicles consisted of chain link fencing. A tank normally carried a roll sixteen feet long, and an M113A1 carried a 12-foot roll. The primary shortcoming of this equipment was that it would only be used in a stationary position. Generally, the RPG screens were emplaced every night, whether in laagers, ambush patrols, or fire support bases. Limited data was obtained, however, as to their genuine effectiveness.



FIGURE G-18 (U). Chain Link Fence Employed for RPG Protection.

### J. Night Vision Equipment

#### (1) General

With the advent of new and improved means for night vision,

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the interrelationships between equipment and techniques resulted in locally adapted field modifications which have quantitative as well as qualitative impact. The various systems must be considered as an integrated capability, parts of which may require modifications to optimize the whole functional area.

### (2) Searchlights

Although the AN/VSS-3 searchlight had been issued with each M551, AR/AAV, it did not appear in the MTOE. It was a well-documented fact that the searchlight greatly enhanced the night fighting and surveillance



FIGURE G-19 (U). AN/VSS-3 Searchlight Mounted on M551 AR/AAV.

capability of the M551. All commanders agreed that as soon as this or a similar searchlight is type classified, it should be included either in unit authorization documents or in the basic issue items (BII) for the vehicle. The primary problem associated with both the M551 and the M48A3 tank searchlights was the requirement to operate the main engine during searchlight operations. Experience indicated that the enemy did not always know where tracked vehicles were located at night. As a result, there was a need for a silent power source that would allow the searchlights to be operated with a low noise level. In a very few cases, extra batteries were carried externally to power lights. This field expedient was short term and unsatisfactory. The pink-light (near-IR) mode on the

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AN/VSS-3 was utilized to increase ambient light levels to enhance the effectiveness of passive night vision devices. All commanders agree that a pink-light filter should be provided for the searchlight on the M48A3.

### (3) Passive Night Vision Devices

Regimental cavalry squadrons were authorized a total of 213 passive night vision devices: 66 individual starlight scopes, 136 crew-served night weapons sights, and 11 medium-range night observation devices. This was a generous authorization, but it was difficult to determine precisely if it was an adequate BOI, because at the time of the evaluation the squadrons had on hand only 62 percent of their authorization. Only 51 percent of the crew-served-weapon sights authorized were on hand. While all these devices were extremely popular, they were more commonly used as hand-held surveillance devices than as weapon sights. As a result, the smaller, more compact, and easier-to-store starlight scope was more accepted. The average of all BOIs recommended by commanders for these devices approximated the full MTOE authorization. All commanders wanted a minimum of one device per track vehicle.

### (4) Infrared (IR) Equipment

Commanders and others indicated that they very seldom utilized vehicle-mounted IR fire control sights and the M48A3 tank searchlight (AN/VSS-1/2) in the IR mode, for several reasons. First, as indicated previously, the requirement to operate the main engine during searchlight operations made IR surveillance unpopular and on occasion impractical. Second, IR equipment was prone to be easily damaged or become inoperative. Third, as a result of the limited fields of view in the AO, starlight scopes were preferred and were quite adequate for surveillance. Fourth, in NDPs, loaders, or on strong points, only one crewman normally remained on alert, and he was located in the vehicle commanders' position with the caliber .50 machinegun. In order to utilize the IR, he would have to go inside the turret and utilize the gunner's sights. The vehicle commander on the M551 had no IR sight, and the M48A3 tank commander's IR sight was generally blocked by the top-mounted, caliber .50 machinegun. Therefore, to utilize the equipment, the vehicle guard had to leave the top of the vehicle, which was unacceptable. In addition to underusage of IR weapon sights and searchlights, it was indicated that IR driving equipment was rarely used. This was because of limited night movement and equipment damage from "jungle busting."

### (5) Night Movement Capability

No equipment authorization inadequacies affected this capability.

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## k. Weapons

### (1) General

Commanders were generally satisfied with the various weapons authorized the squadrons, with the exceptions noted below.

### (2) M48A3 and M551 Machineguns

Commanders liked the mix of one M73 coaxial machinegun and one caliber .50 machinegun on the M48A3 and the M551, although the former weapon was underused. All commanders felt that the cupola-mounted, electrically fired, caliber .50 machinegun should be modified for top-mounted manual fire. All vehicles had been modified to provide this capability. There were several other machinegun configurations as described in paragraph 3c(3), Annex B. While commanders permitted these modifications, they expressed no requirement for permanent addition of machineguns to these vehicles. Examples of these modifications are shown in Figure G-20 and in Annex O.

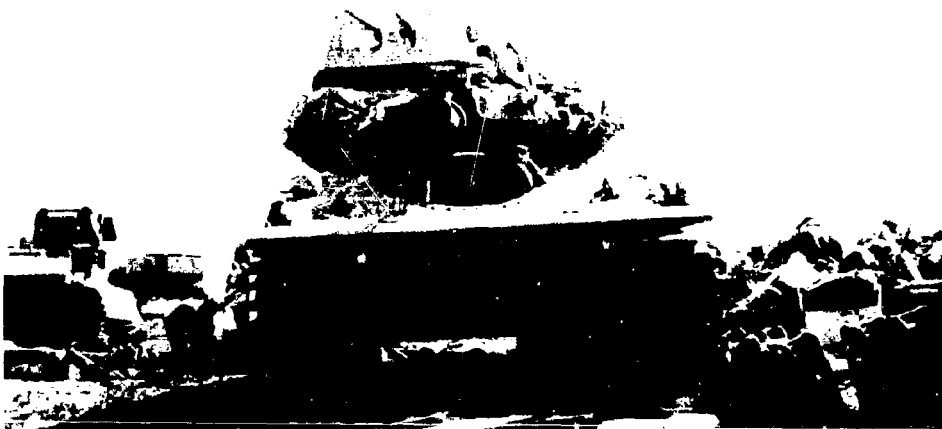


FIGURE G-20 (U). M551 AR/AAV Dual Caliber .50 Machineguns.

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## (3) M48A3/M551 Individual Crew Weapons

Each M551 crew was authorized four caliber .45 pistols, one CAR-15, and one M79 grenade launcher. Individuals were satisfied with this allocation. The M48A3, on the other hand, was authorized four caliber .45 pistols and two caliber .45 machineguns. There was a consensus that the submachineguns should be deleted, because they are too heavy and bulky for dismounted use, have a slow rate of fire and limited available ammunition, and are not as effective as other available weapons for close-in protection. In their place, commanders desired at least one M79. In areas where there were serious limitations on firing organic tank weapons because of the danger of ricochet to friendly troops and civilian population, the M79 had become the principal weapon used for reconnaissance by fire. There were varying opinions regarding a replacement for the second submachinegun. Some wanted the M16, some the CAR-15, and some an M60 machinegun.

## (4) Sniper Equipment

The squadrons were not provided sniper equipment on their authorization documents. All commanders indicated they would like to have a sniper capability.

## (5) Supply Vehicle Weapons

Commanders desired to retain the authorized supply vehicles' caliber .50 machineguns, although they were only occasionally used for their intended purpose. The justification presented was based on increased RVN requirements that had to be met from all available assets.

## (6) Machineguns

There was a substantial number of machineguns located in the three squadrons. The justification was the same as that stated for the supply vehicle weapons.

## 1. Communications Equipment

### (1) General

The quantitative aspect of the communications equipment was extremely difficult to assess. The equipment operated efficiently during the evaluation; however, there was substantial excess equipment on hand as shown in Annex C. This excess was a result of the interrelationship between levels of communications equipment authorized in the squadrons, varying operational requirements, and equipment usage for purposes other than intended, as outlined in Annex D. Identifiable problems are addressed in this paragraph. A more detailed analysis of communications is included in the following.

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## (2) FM Radios

There were some expressed requirements for changes in FM radio types and quantities to improve responsive command and control.

### (a) Regimental Headquarters

The number and location of radios required in the regimental headquarters varied with the requirements of the controlling headquarters, liaison requirements, base camp/PSA security requirements, mission variations, and other variables. At the time of the evaluation the regiment was operating in eight FM nets, five of which were secure or which should have had secure capability. Annex P contains a diagram of the nets and equipment used by the CP at the time of the evaluation. In addition, at various times some of these nets were required to transmit and receive through relay stations established by the regiment. As a result, the regimental CP had to be flexible in configuring its assets to meet requirements. Because of this, it was impossible to identify precisely what additional equipment was needed. In general, however, the peculiarities of the war generated communications needs in addition to the conventional regimental requirements. Figure G-21 summarizes total quantities of major items of FM equipment authorized and utilized by the CP and the base camp/PSA security elements of HHT at the time of the evaluation.

TYPE EQUIPMENT	AUTHORIZED	IN USE
AN/VRC-12	4	5
AN/VRC-46	16	19
AN/VRC-47	9	10
AN/VRC-49	1	3
AN/VRC-53	-	1
AN/PRC-25	1	16
AN/PRC-77	-	2
TSEC/KY-8	3	8
TSEC/KY-38	-	2

FIGURE G-21 (U). FM Radio Equipment Authorized/  
Utilized by Regimental HHT.

G-40

CONFIDENTIAL



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## (b) Command Vehicles

Virtually all command ACAVs down to platoon level had been equipped with two AN/VRC-46 radios rather than the authorized AN/VRC-12/47. The troop commander was required to operate in two nets, while the platoon leader generally had a similar requirement, particularly when working out of sight of the troop command group. With the authorized configuration, the commander had to drop down inside his vehicle and change frequencies on both the receiver-transmitter and the auxiliary receiver in order to maintain continuous communications on both nets. When engaged in a firefight, calling for dustoff, or in any other emergency this was impractical. Virtually all commanders felt command ACAVs should be authorized two receiver-transmitters. The same situation and solution applied to command tanks.

## (c) Cavalry Platoon Radios

Commanders expressed a requirement for a second AN/PRC-25 radio in each cavalry platoon. This radio was considered necessary as platoons were frequently tasked to provide multiple ambush patrols and listening posts. Commanders felt that this addition would eliminate the requirement to dismount a AN/GRC-125 from a scout ACAV (which would leave the vehicle without any means of external communications). There is a need for continuous communications for all tracked vehicles because of the 24-hour day and 360 degree environment. This rationale questions the validity of multi-employment radios.

## (d) M109 Howitzer Radios

Commanders expressed a requirement for each M109 howitzer to contain an AN/VRC-53 radio [paragraph 2f(2)(b), above].

## (e) Mechanized Flame Section Radios

Commanders desired that the M132A1s be authorized radios, preferably one each AN/VRC-46 [paragraph 2d(2)(a), above].

## (f) Secure Equipment

1. As indicated in Figure G-21, the regimental HRT's requirements for secure communications equipment exceeded authorizations.

2. As contrasted with most other battalion-sized units in RVN, the squadrons of the ACR did not express a need for secure radio equipment for use within their squadrons. This appeared to be because immediately available organic aircraft satisfied requirements.

# CONFIDENTIAL

## (3) AM Radio Equipment

The regiment fully utilized its conventional AM radio equipment - however, not entirely in the traditional manner. The regiment reported difficulties resulting from incompatibility between its on-hand radio teletypewriter sets, AN/VRC-29, and the newer radio teletypewriter sets, AN/VSC-2 or -3 and AN/GRC-122 or 142, which were located at the division exercising operational control of the regiment. To solve this problem, the regiment had acquired excess AN/GRC-142's. Individuals involved with this problem agreed the regiment should be issued the later model equipment.

## (4) Rectifiers

Commanders and communication officers indicated a need for three rectifiers per squadron to convert available 110-volt AC power to 24-volt DC power for operating stationary communications equipment in the FSA and regimental rear base camp. Many of these items were on hand. Use of this equipment precluded the wasteful running of tactical vehicle engines to generate electricity. This requirement was a derivative of the semifixed bases which units were required to maintain in RVN.

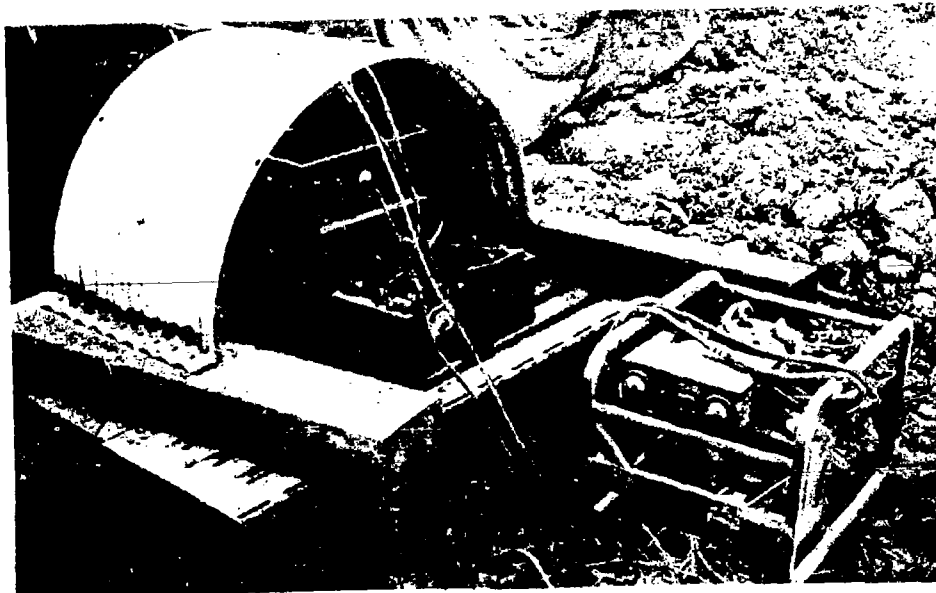


FIGURE G-22 (U). Rectifier Providing Charge to DC Batteries.

G-42

# CONFIDENTIAL

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### (5) AB-577 Antenna Base

Squadron commanders expressed a requirement for three AB-577's for use in the base camp, the PSA, and the field CP locations. They would be employed in conjunction with multiple RC-292 antenna heads. The RC-292, while generally satisfactory, frequently could not be raised high enough to clear the tall rubber trees and jungle growth. It was considered that the added height of the AB-577 would extend communications range. Transport of the AB-577 on the M577A1 presented no problem. Each squadron had at least one AB-577 during the evaluation.

### (6) Communications Nets

The number of nets and usage of traditional nets varied in RVN. These variances are depicted in Annex P.

#### m. Early Warning Equipment

##### (1) Radar Equipment

Commanders considered the basis of issue of radar sets adequate [paragraph 2d(2)(b), above].

##### (2) Early Warning Devices

Each cavalry squadron was authorized 48 seismic intrusion detectors, sets, AN/PSR-1. Quantities on hand varied between 9 and 32. Those interviewed were not overly enthusiastic about this device. It was employed sporadically with limited results, in part due to lack of adequate employment instructions. Maintenance was a major problem with this equipment. Generally, replacement equipment had not been requisitioned due to lack of enthusiasm for the equipment. The squadrons also had limited quantities of breakwire audio devices, AN/GSS-9, on hand. This device was unpopular even among those few individuals familiar with it. The ease with which the wire could be broken causing high numbers of false alarms, and lack of an identifiable signature of enemy movement were considered major shortcomings. Finally, the squadrons had on hand limited quantities of the AN/GSQ-151 patrol seismic intrusion detector (PSID). No conclusive opinions had been reached regarding this item.

#### n. Navigation Equipment

##### (1) General

Ground vehicle navigation has continued to be a very serious problem [paragraph 2c(1)(d)(3), above]. To alleviate this problem, certain suggestions for navigational aids were brought forth during the evaluation.

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## (2) Vehicular Compass

Commanders indicated there was a requirement for a dependable, durable, vehicular-mounted compass on tracked combat vehicles.

## (3) Vehicular Odometer

Commanders indicated that cross-country navigation would be simplified if the vehicle odometer were converted to read in kilometers.

## (4) Vehicle-Mounted Position Locator

Commanders interviewed were not uniformly in favor of such equipment. To be acceptable it would have to be durable, dependable, easy to operate, accurate, and not in the way of the vehicle crew.

## (5) Strobe Signalling and Navigation Light

Every commander interviewed who was familiar with the small, handheld, strobe light felt that it should become a BII for each tracked combat vehicle. They felt it would be an effective signalling device for night identification, in aerial support operations, and for marking front lines for fire coordination.

### o. Accessory Equipment

#### (1) General

Each squadron felt several accessory items of equipment were needed which were not authorized by the MTOE. Those warranting discussion are considered below. Concurrently each squadron had certain equipment authorized which was not needed. These items are enumerated in Annex C.

#### (2) Steam Jenny

Squadron maintenance personnel felt very strongly about the requirement for a steam-cleaning capability to remove grease and sludge from engine compartments. Frequent cleaning of engine components reduces the hazard of fire, allows proper cooling of the equipment, and prevents overheating. One squadron had experienced a series of fires in tank engine compartments that had resulted from the accumulation of leaves and spilled lubricants and fuel. A steam-cleaning apparatus would also provide a significant aid in conducting routine maintenance operations and inspections. The steam jenny would be logically located in the squadron maintenance platoon's semifixed FSA facility.

#### (3) Loading Equipment

No major problems were encountered in this area. Clarification and recognition of USARV equipment authorizations constituted the major issue.

G-44

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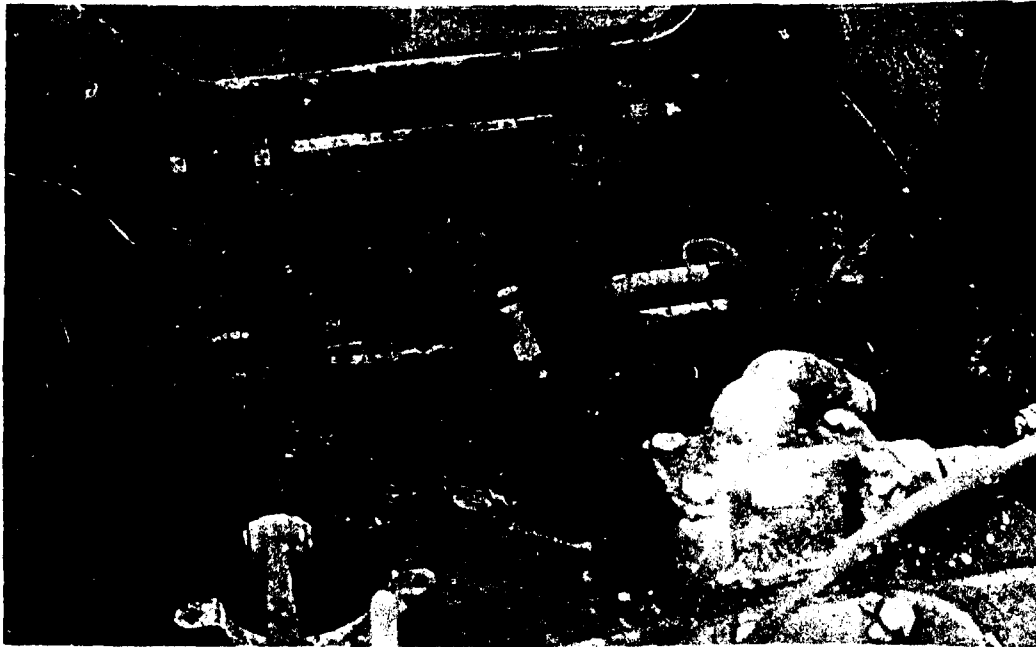


FIGURE G-23 (U). Accumulation of Sludge in M113A1 Engine Compartment.

(4) Fuel Transfer Pumps

Fuel transfer pumps were requested to conduct field refueling operations [paragraph 2d(3)(a), above].

(5) PLL Storage Trailers

Troop PLLs were consolidated at squadron level. Those interviewed felt a requirement existed for the 6-ton expandable trailer to store repair parts [paragraph 2d(3)(b), above].

(6) Chain Saws

All squadron commanders stated there was a requirement for chain saws in addition to those in the attached engineer platoons. The troops were faced with many small tasks that would be more efficiently accomplished if this equipment were readily available. The desired basis of issue was one per maneuver company/troop and two in HHT.

(7) On-Vehicle Recovery Equipment

In a majority of cases, vehicles that became mired were recovered by other combat vehicles of the platoon or troop. Unit

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recovery vehicles rarely accompanied combat elements on field operations away from the CP/NDP/PSB. This situation accentuated the importance of on-vehicle recovery equipment. All commanders agreed that the lengths of authorized tow cables were too short. In many cases the recovery vehicle, approaching the mired vehicle, also became mired. To avoid this, several cables were connected by clevises. However, there was a critical shortage of tow cables, one squadron having only approximately 25 percent of its authorization. In addition, it was virtually impossible to spare the man-hours required to properly maintain the constantly used, constantly wet, wire rope during rainy seasons. As a result, the cables deteriorated, weakened, and were broken. All commanders stated they would like two longer tow cables per tracked vehicle. A length commonly mentioned was 20 feet. They did not think on-vehicle storage would be a problem. In addition, they wanted an average of two tow bars per cavalry platoon and one per tank platoon. These would greatly simplify towing of disabled vehicles, and would decrease the wear on tow cables. Finally, they were all unenthusiastic about capstan kits, thinking them too complicated to install and too bulky to carry.

G-46

## CONFIDENTIAL

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## ANNEX H

### DIVISIONAL ARMORED CAVALRY SQUADRONS

#### 1. (C) EMPLOYMENT

##### a. Missions

The traditional roles and missions of the divisional armored cavalry squadrons, as defined in established doctrine, were modified in the RVN environment - although not as extensively as those of the ACR. During the evaluation, squadrons were employed in a variety of missions by their higher headquarters. There were three basic methods of employment used: as a combat maneuver battalion operating in an assigned AO; as an economy-of-force element to screen or secure a large area; and as a "fire brigade," moving when required to the area of greatest potential enemy threat within the division AO. Squadrons were periodically placed under the operational control of brigades for specific missions. Two of the squadrons were assigned to separate brigade-size units during the evaluation, but were employed generally as described above. Figure H-1 shows the locations of the divisional cavalry squadrons at the time of the evaluation. Figure H-2 shows the relative combat strength of the squadrons committed to various types of missions during the evaluation. Mission types have been grouped into broad categories for simplicity and to avoid confusion in terms. Analysis of Figure H-2 shows that reconnaissance missions were conducted most frequently, although security missions were common in three units. As in the ACR, divisional squadron commanders felt that security missions did not make the best use of the squadrons' offensive capability.

##### b. Organization for Combat

(1) Figure H-3 contains an organizational chart for the divisional armored cavalry squadrons. As in the ACR, cavalry troops were periodically detached, and squadrons frequently had operational control of infantry companies. With these assets, squadron commanders were able to task-organize the types of teams required. As indicated in Figure H-4, one squadron had a tank company permanently attached, and another squadron conducted extensive combined operations, frequently working with as many as two ARVN or RF companies. Cross attachments between cavalry troops were rarely made except to augment a particular troop for a specific mission. Troops were infrequently scrambled, as all commanders preferred to retain the flexible platoon organization. Other assets available to the squadrons during the evaluation are indicated in Figure H-4.

(2) The organic air cavalry troops were not under the operational control of the squadrons during the evaluation. All air cavalry troops were under the permanent control of higher headquarters.

H-1

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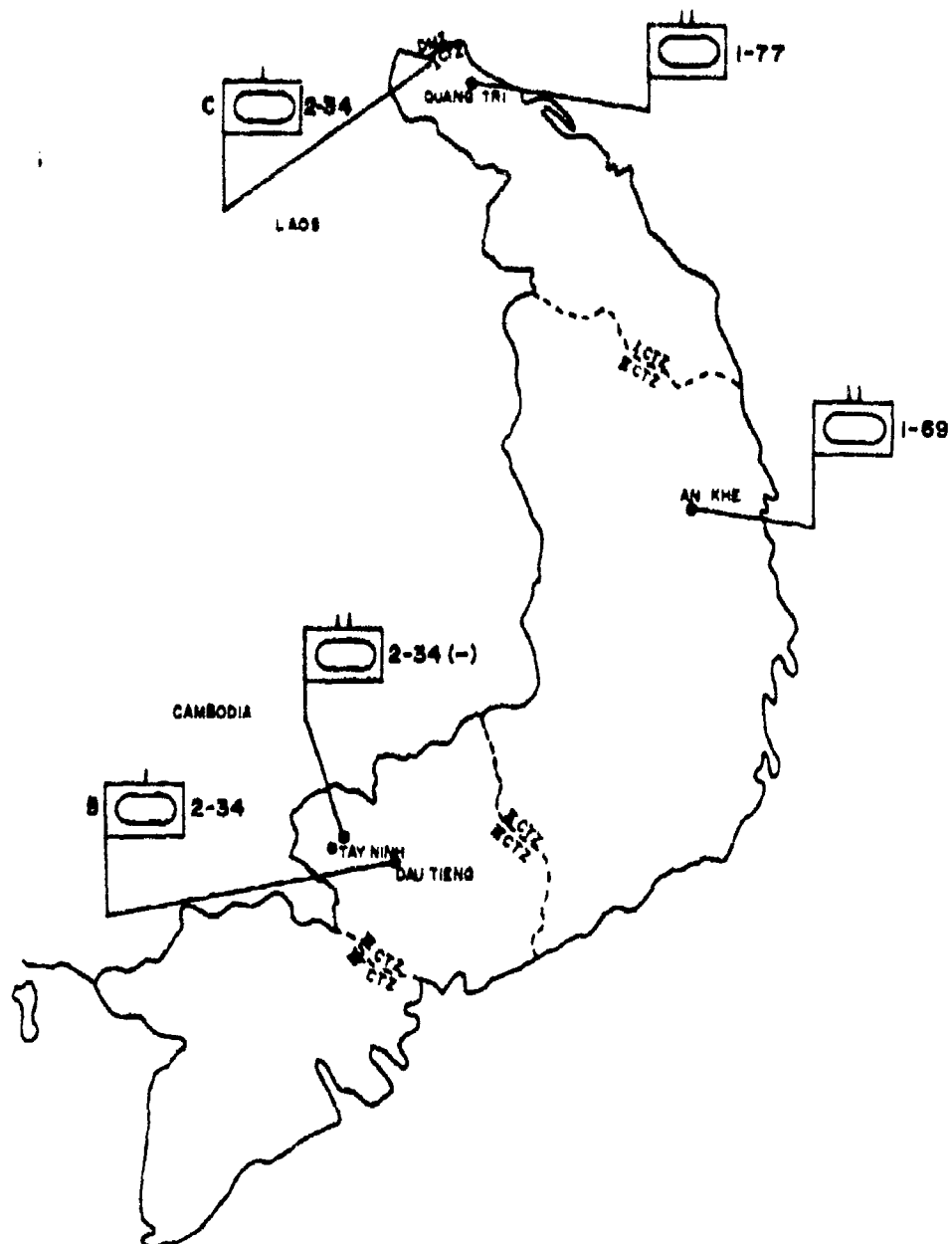


FIGURE H-1 (C). Location of Divisional Armored Cavalry Squadrons During the Evaluation (U).

H-2

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UNIT	DAYLIGHT MISSIONS (2)							NIGHT MISSIONS		
	RECONNAISSANCE OPERATIONS	SECURITY OPERATIONS	READY REACTION FORCE	STAND DOWN AND MAINTENANCE	CIVIC ACTION	ROAD CLEARING	NIGHT DEFENSIVE POSITIONS	AMBUSH PATROL AND STRUCKPOINT	BASE CAMP SECURITY	
1/1 CAV	56%	4%	7%	33%			67%	1%	32%	
2/1 CAV (1)	53%	32%	1%	14%		15%	74%	16%	7%	
3/4 CAV (1)	75%	8%		12%	5%	10%	80%	10%	10%	
3/5 CAV (1)	64%	20%	5%	11%		4%	80%	8%	12%	

(3)(4)

## Notes:

- (1) Where total percent is greater than 100 percent, it is due to the commitment of combat elements to more than one mission per day.
- (2) See Glossary of Terms, Annex A, for mission definitions.
- (3) Data was unavailable for 1/4 Cavalry due to redeployment.
- (4) The 1/10 Cavalry was not visited during the evaluation.

FIGURE H-2 (C). Average Combat Power Committed to Each Type of Mission (U).

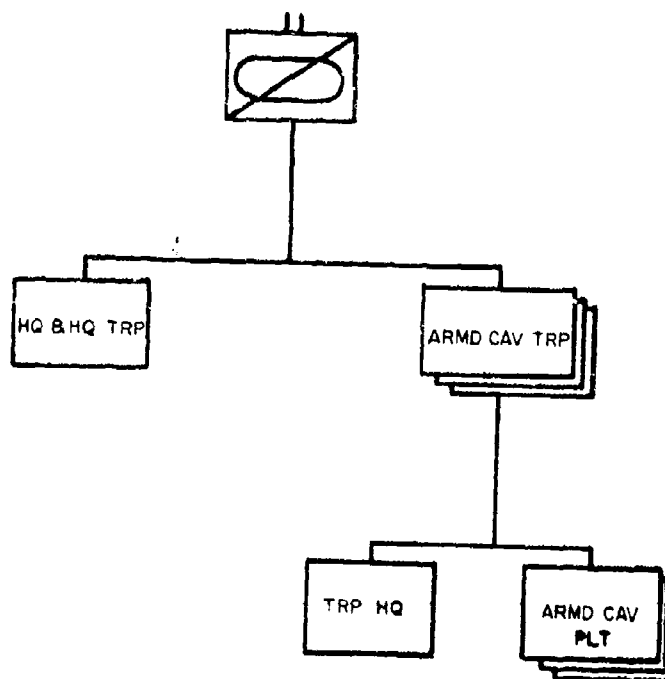


FIGURE H-3 (U). Organizational Chart, Divisional Armored Cavalry Squadron (Less Air Cavalry Troop).

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ORGANIC ELEMENTS AVAILABLE										OTHER ELEMENTS AVAILABLE																						
ORGANIC ELEMENTS AVAILABLE										US ELEMENTS												ARMY/AF UNITS										
										ARMY CAV TRPS			AIR CAV TRP	HHT PROV PLT	TANK CO	ARMY CAV TRP	INF CO	INF	PLT	ARTY BTRY	ENGR SQD					SCOUT DOG TM	CRIP PLT	AVLB SEC	DUSTERS AAA	DEMO TM	INF	CO
UNIT										1	2	3		5%	25%	57%	10%							2	3	1	2	1	2			
1/1 CAV										100%	100%	100%	0%	100%		5%	25%	57%	10%													
3/5 CAV										100%	100%	100%	0%	*	100%																	
2/1 CAV										100%	100%	75%	0%	0%						13%								75%	15%	15%	10%	
3/4 CAV										100%	100%	100%	0%	*					57%			55%				100%	63%					

• Provisional Platoon Not Locally Organized.

FIGURE H-4 (C). Average Available Combat Power, Divisional Armored Cavalry Squadron (U).

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(3) In addition to the organic and attached elements indicated in Figure H-4, the squadrons also had access to nonorganic fire support. During the evaluation period, the squadrons received an average of 11 artillery fire missions, 0.5 armed helicopter sorties, and 0.2 close air support sorties per day. All commanders felt this support was adequate.

### c. Tactics

#### (1) Reconnaissance Operations

(a) The majority of operations conducted during the evaluation were of a reconnaissance nature. Whenever possible, reconnaissance was used as a technique to accomplish security objectives. The maneuver elements employed to accomplish the assigned mission were determined by terrain and enemy threat. Three squadrons conducted troop-size operations almost exclusively; one frequently conducted platoon-size operations; while in another squadron, platoon-level operations predominated. Annex F contains summaries of operations conducted at the time of evaluation and illustrations of squadron AOs. Although two squadrons were equipped with M48A3 tanks at the time of evaluation, all units used formations and battle drills similar to those employed by the ACR.

(b) Troop AOs were normally assigned and, and troop commanders frequently further divided AOs into individual platoon areas. The AO size varied from unit to unit. One squadron commander did not assign troop AOs, but employed the troops throughout the squadron AO to prevent establishing operational patterns and to provide all commanders first-hand knowledge of the entire AO.

(c) One squadron conducted frequent troop-size dismounted reconnaissance operations for periods up to 7 days, because mountainous terrain in much of the unit AO prohibited mounted operations. These operations were frequently airmobile. An average of commanders' estimates indicated that 18 percent of the time, troop elements were dismounted primarily to conduct detailed searches and to enter areas not accessible to vehicles. As in the ACR, dismounted elements rarely moved far from their vehicles, which were used to provide fire support.

#### (2) Security Operations

The squadrons performed some type of security mission daily; however, the percent of combat power committed by each squadron differed significantly, as indicated in Figure H-2. These variations are indicative of the great differences in operational environment from one location to another in RVN. As in the ACR, it was felt that required security could best be obtained by aggressive reconnaissance. The most commonly assigned security missions were road clearing, route security, security of populated areas, and security of fixed and semifixed installations. Techniques

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employed to accomplish security missions were generally similar to those used in the ACR.

### (3) Night Operations

(a) Squadrons conducted some type of mounted night movement on an average of 30 percent of the nights. To facilitate movement, units utilized flares, headlights, blackout drive, or searchlights for illumination, although occasionally no illumination was used. Commanders estimated that 90 percent of these moves were for the purpose of inserting ambushes or establishing strong points.

(b) One squadron secured fire support bases at night by establishing a mobile mounted security screen of elements 1 - 4 kilometers outside the FSB. The rationale for this technique was that it provided a better position for reaction, in the event of a ground assault or indirect fire attack against the FSB. It also increased the likelihood of locating the enemy's firing positions. The commander felt that, if security elements remained in the FSB, they would be unable to capitalize on their mobility when under attack.

(c) Another squadron, in order to counter the indirect fire threat of the enemy within its AO, conducted limited mounted night reconnaissance to deny the enemy suitable firing positions near fixed installations. This squadron also established multiple mounted and dismounted ambushes.

(d) Dismounted ambushes were more common in divisional squadrons than in the ACR. One unit employed these ambushes primarily to support its sniper program. Another squadron, which was operating in relatively open rolling terrain near the demilitarized zone (DMZ), employed individual platoon NDPs almost exclusively. This technique enabled the squadron commander to provide extensive night coverage of his large AO. Each platoon established its NDP within mortar range of adjacent platoons. Fighting positions were prepared on each side of the APC/ACAVs and the M60 machineguns were dismounted and placed in these positions. In the event of a ground attack, only the vehicle commander and driver fought from the vehicle. Listening posts and ambushes were deployed to provide security and to screen the unoccupied areas between platoon NDPs.

### d. Enemy Contact

(1) The level of conflict encountered by the divisional armored cavalry squadrons throughout the data collection period was low. The average of all units' contacts was 31 percent of the days during the 40-day evaluation period. Seventy percent of all contacts were with squad-size or smaller enemy elements. Forty-five percent were US initiated and the remainder enemy initiated. The enemy-initiated incidents consisted of: 55 percent, sniper attacks; 27 percent, ambushes; and 18 percent,

H-7

## CONFIDENTIAL

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FIGURE H-5 (U). Armored Cavalry Troop NDP.

indirect fire attacks. On the average, each contact resulted in four enemy KIA and two captured.

(2) Although the squadrons faced a smaller mine threat than the ACR, divisional squadron commanders felt that the mine threat was extremely serious. Sixty-nine percent of the mines encountered were safely detected, while the remainder caused vehicle damage. A majority of mines detected were found visually. Of the mines encountered, 80 percent were on roads or trails and ranged from locally manufactured 20-pound box mines to pressure-detonated US 8-inch artillery shells. Estimated size of mines detonated by tracked vehicles ranged from 20-pound box mines to US 500-pound bombs. RPG incidents were less frequent than mining incidents and caused less damage. Of those RPGs fired at vehicles, 18 percent impacted, causing light to moderate damage and producing relatively few casualties.

H-8

CONFIDENTIAL

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## 2. (C) ORGANIZATION

### a. General

#### (1) Introduction

The organizational problems encountered in the divisional cavalry squadrons are documented in this paragraph. Included herein are only those issues on which there was substantial agreement among the commanders and others interviewed. There is a necessary correlation between organization and equipment. Where an organizational problem has an implied equipment impact, the latter is concurrently discussed. On the other hand, quantitative equipment problems are discussed in paragraph 3 and the qualitative aspects of equipment are discussed in Annex N. During the evaluation, four squadrons were equipped with the M551 AR/AAV and two with the M48A3 tank.

#### (2) Organizational Mix

All commanders interviewed were generally satisfied with the authorized mix of subordinate elements in the squadron. However, the detachment of each squadron's air cavalry troop was considered a serious degradation of the unit's combat capability.

#### (3) The Army Authorization Document System (TAADS)

All commanders felt that TAADS was unresponsive, and that changes were made at too high a level.

### b. Squadron Headquarters

#### (1) Squadron Command and Control

##### (a) General

Many of the problems regarding command and control found in the divisional squadrons were similar to those found in the ACR. Additional problems were encountered as a result of differences in MTOE organization, methods of employment by higher headquarters, and respective AOs.

##### (b) Helicopters

Unlike the squadrons of the ACR, divisional squadrons had no organic aviation sections in their HHT. With detachment of the air cavalry troops by higher headquarters, squadrons were dependent on brigade or division assets for aviation support. This support was considered inadequate by most squadron commanders. Allocated blade time ranged from

H-9

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1 to 8 hours daily, with an average of 3 hours. This allocation had to satisfy all air requirements, including logistical and administrative uses. In squadrons where helicopter support was particularly limited, the commander and S3 would attempt to visit each troop daily and concurrently accomplish reconnaissance and mission planning. In the remaining squadrons, the supporting helicopter was used in a manner similar to those in the ACR, although not as exclusively by the commander. Because of the wide-ranging operations conducted by the squadrons, commanders felt that there was a genuine requirement for an aviation section in HHT to perform the command and control functions discussed in paragraph 2c(1), Annex G.

### (c) Command ACAVs

As in the ACR, squadron commanders made little use of their command ACAVs due to environment and unit dispersion. One commander used his ACAV as a jump CP, as he felt the M577A1, which was used in other squadrons, was a signature vehicle. Other uses of command ACAVs are discussed in paragraph 2c(2), below.

### (d) Communications Equipment

Commanders considered the authorized communications equipment to be adequate for command and control except for those items indicated below.

1. Commanders were in agreement with those in the ACR regarding the need for two receiver-transmitters in all command ACAVs to enable the commander to communicate in two or more nets simultaneously, [see paragraph 31(2), Annex G].

2. Commanders felt that the authorized quantity of secure voice radio equipment was inadequate. They relied heavily upon FM secure equipment for transmission of operations orders as well as for command and control. Unlike commanders in the ACR, all thought that a secure voice capability was required down to troop level. Equipment authorizations are further considered in paragraph 31(2) below.

### (2) Fire Support Coordination

As indicated in paragraph 3b(1), Annex B, artillery liaison teams attached to the squadrons established an FSOC, responsible for coordinating organic and nonorganic fire support in the unit AO. Squadron artillery liaison teams came from a divisional or corps GS artillery unit. As in the ACR, the artillery liaison team normally operated from the S3 Air's M577A1. Commanders were satisfied with this arrangement, but, in each case felt that the teams came with insufficient radios and secure voice equipment. Additional equipment had to be supplied from squadron assets.

H-10

## CONFIDENTIAL



# CONFIDENTIAL

## (3) Unit Location

Although navigational problems encountered by divisional squadrons were not as serious as those found in the AO of the ACR, all units employed similar techniques to aid in navigation [see paragraph 2c(3), Annex G]. Commanders agreed on the need for a vehicular-mounted compass and modification of odometers to read in kilometers.

## (4) Staff Functioning

(a) Squadron staffs operated in a manner similar to the ACR, as described in paragraph 2c(4), Annex G. The S3 functioned as a deputy for operations and maneuver and was normally located with the S2 and S3 Air in the field TOC. Administrative and logistical activities were controlled from the squadron rear or from a squadron forward base under the supervision of the executive officer. Two squadrons maintained CPs in their rear area. The requirement for operating multiple CPs on a 24-hour basis overextended authorized staff personnel.

(b) As in the ACR, the S5 assumed an increasingly important role in the operations of the divisional squadrons. With the Vietnamization of the war and emphasis on civic action, the S5 was used extensively for coordination of combined operations, PSYOPS, and MEDCAPS. To accommodate this increased activity, some commanders had augmented the S5 section with as many as four additional personnel. All commanders felt additional personnel should be authorized by MTOE.

## (5) Dispersion and Rear Area Requirements

Except for one squadron, unit dispersion and rear area requirements were not as pronounced as in the ACR. The HHTs were generally split into two locations: a rear area, normally located in a major base camp; and a forward area, located with or near the squadron forward CP. Distances between these two locations averaged 36 kilometers, with a range of 5 - 75 kilometers. On the average, squadron HHTs had 37 percent of their personnel in the forward area and the remainder in the rear. The resultant unit dispersion of both personnel and equipment increased security requirements, which had to be met from organic assets.

## (6) Liaison

All of the squadron commanders indicated that their liaison organization was adequate and that no changes were necessary.

### c. Headquarters and Headquarters Troop

#### (1) Command and Control

Command and control of HHT presented no significant organizational problems. In the majority of squadrons, the troop commander operated from the rear area, where he provided administrative and logistical support

# CONFIDENTIAL

## CONFIDENTIAL

for his troop. He frequently visited the forward area to inspect maintenance and troop welfare or to assist in the displacement of the squadron CP. The HHT commanders were not responsible for the tactical employment of combat support elements, the functioning of service support elements, or CP/base camp security. These tasks were performed by various members of the squadron staff. The responsibility of this commander was substantially less than his counterpart in the ACR.

### (2) Combat Support Elements

#### (a) Provisional Combat Platoons

Three of the squadrons had formed provisional combat platoons from HHT command, combat, and combat support vehicles. These platoons were intended to augment squadron combat capability as well as fulfill limited economy-of-force missions. One squadron formed a "mini-platoon," using the ground surveillance section ACAVs to satisfy their higher headquarters requirement for a platoon to operate in conjunction with the squadron's air cavalry troop, which had been permanently attached to that headquarters. The two remaining squadrons employed these platoons as extra maneuver elements, directly under the squadron or attached to a cavalry troop when organic troop platoons were detached, on standdown, or when additional combat strength was needed. Figure H-6 indicates the actual employment of HHT combat and combat support vehicles at the time of the evaluation.

#### (b) Mechanized Flame Platoon

Each squadron was authorized four M132A1 mechanized flamethrowers and two XM45E1 track-mounted service units. Two of the squadrons had not been issued either the M132A1's or the service units. One squadron did not utilize its M132A1's due to the lack of service units. Commanders who had operational M132A1's indicated they were satisfied with the BOI and considered it a valuable asset. In two squadrons which had the authorized equipment, the platoon had been combined with other HHT combat support vehicles as shown in Figure H-6. As in the ACR, all commanders agreed that the M4A2 truck-mounted service unit was undesirable due to its extremely limited cross-country mobility and limited fuel capacity. Typical missions for the flame section were similar to those discussed in paragraph 2d(2), Annex G.

#### (c) Ground Surveillance Section

1. Each squadron HHT was authorized six AN/PPS-5 radar sets, each carried on a M113A1 APC/ACAV. Figure H-7 indicates radars on hand in each squadron during the evaluation. In units that had operational radar sets, an average of 2.6 sets were employed 91 percent of the nights. Figure H-8 indicates which headquarters controlled employment and methods of employment and movement. This table shows that only one squadron (3/5 Cavalry) employed its ground surveillance radar as doctrinally intended, as a mobile adjunct to maneuvering elements.

H-12

## CONFIDENTIAL



## CONFIDENTIAL

2. While some squadrons obtained a few positive sensings that were subsequently confirmed by other methods, user confidence in radar as a reliable means of detection was generally low. Frequent false readings, failure to detect known enemy movement, excessive repair time, and shortages of trained operators all contributed to the problem and to low usage of available radars.

3. Commanders indicated a need for additional personnel in the ground surveillance section. It was thought that the authorized 16 personnel were insufficient to operate six radar sets, to man six ACAVs, and to provide sufficient personnel for operator relief and vehicle security. The most frequently stated opinion was that five personnel were required for each vehicle.

### (d) Requirement for a Bridge Section

The squadrons were authorized no organic bridging. Most commanders felt a bridge section -- two bridges and two launchers -- was needed. They felt they had not received adequate engineer bridge support from higher headquarters to meet operational requirements. One commander did not feel bridging was necessary in his AO because of the terrain.

### (3) Combat Service Support

#### (a) Support Platoon

##### 1. General

Divisional armored cavalry squadrons drew various classes of supplies from different and often widely scattered locations, as indicated in Figure H-9, section A. Figure H-9, section B, shows that, although some nonorganic transport was used to move supplies to squadron forward bases, most units utilized organic vehicles as the primary mode of transport for this purpose. Each support platoon was authorized eight M548 tracked cargo carriers and ten 5-ton cargo trucks. Commanders were generally satisfied with this vehicle mix and felt the authorization adequate to support operations. However, both technical and supply personnel and commanders indicated a requirement for an assistant driver for each M548 to assist in operation and maintenance of the vehicle. All units had a shortage of M548's, and some had been issued additional 5-ton trucks as substitute items. Figure H-9, section C, shows the distribution of these assets. One squadron had been augmented by higher headquarters to provide area Class I and III support for itself and two battalion-sized elements within its AO. As a result, the squadron, in addition to maintaining POL storage for its own use, maintained a supply of fuel for area support, as well as a supply of JP-4 and AVGAS for use by Army aviation units at a nearby airstrip. The squadron was also required to operate and maintain this airstrip.

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		1st Day	2nd Day	3rd Day	4th Day	5th Day
A	Classes of Supplies and Location Issued	Depot	None	None	II, III, IV, V VII	VII
		Distance (Depot to Squadron Rear)	N/A	N/A	45 Km	40 Km
		Squadron Rear or Division Support Command	II, IV, V, VII Package Class III	I, II, IV, V Package Class III	I, VII	I, II, III, IV, V
		Distance (Squadron Rear to Squadron Forward)	30 Km	7 Km	75 Km	50 Km
		Squadron Forward Base	1 Water Bulk Class III	Water Bulk Class III	Water	Water
B	Method of Transport to Squadron Forward Base and Frequency	Air	None	None	Class I & Helicopters USAF C130 3 Times Weekly	None
		Ground	Organic Transportation Daily	Organic Transportation Daily	Organic and Support Transportation Weekly	Organic Transportation Daily (Line Troops Only) Daily
C	Supply Vehicles Available and Level	M548 (8 Authorized in Support Platoon)	5 Support Platoon, 1 per Line Troop	7 Support Platoon	4 Support Platoon	4 Support Platoon, 1 per Line Troop
		M54, 5-Ton Truck (10 Authorized in Support Platoon)	10 Support Platoon	7 Support Platoon	14 Support Platoon	9 Support Platoon
		M105, 2 1/2 Ton Truck (6 Authorized Support Platoon, 1 per Troop)	2 Support Platoon 2/Troop	2 Support Platoon 2/Troop	2 Support Platoon 2/Troop	2 Support Platoon 2/Troop
D	Method of Transport to Line Troops	Air	1 Hot Meal Daily	1 Hot Meal Daily	1 Hot Meal Daily, all Classes; 2 CH-47 Sorties every 3rd Day, 2 Troops	1 Hot Meal Daily, all Classes; 2 CH-47 Sorties Daily, 2 Troops
		Percent	90%	5%	60%	65%
		Ground	All Classes on Stand Down by Squadron and Troop assets	Squadron Resupplied each Troop Daily all Classes Using 1-2 Vehicles per Troop	1 Troop Operated from Troop Forward Base, Resupplied Overland Daily	1 Troop Operated from Squadron Forward Base
E	Unit Class III Equipment and Storage	Vehicle Mounted Class III Equipment Tank and Pump Units, 5 - authorized	Support Platoon 4 5 Ton Trucks with Tank and Pump Units Mounted	Support Platoon 1 5 Ton Truck with Tank and Pump Unit, 3 M548 with 500-Gallon Bladders	Support Platoon 1 5000-Gallon Tanker, Troop; 1 with 1 5 Ton Truck with Tank and Pump Unit, 2 with 1 M548 each with Tank and Pump Units	Support Platoon 1 5 Ton Truck with Tank and Pump Unit, 2 M548 with Tank and Pump Units
		500-Gallon Bladders available (5 authorized)	4	6	7	7
		Squadron Bulk Class III Storage, Capacity and Location	Rear 10,000 Gallon Diesel	None	Forward Base 10,000 Gallon Diesel, 30,000 Gallon Fuel, 4,000 Gallon Oil	None

FIGURE H-9 (U). Resupply Operations, Divisional Armored Cavalry Squadron.

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## 2. Resupply Methods

### a. General

Four out of five squadrons moved from 50 to 90 percent of their supplies to forward elements by air. Support platoon personnel prepared all air loads. One squadron resupplied overland almost exclusively because of an available road net and limited air assets. Classes of supplies moved, and the frequency, and transport method used, are summarized in Figure H-9, section D. All elements in the field received one hot meal daily by helicopter.



FIGURE H-10 (U). Air Resupply of Divisional Armored Cavalry Squadron.

### b. Class III Resupply

Figure H-9, section E, documents Class III handling equipment and usage in each unit. Squadrons accomplished air resupply as described in paragraph 2d(3), Annex G. All personnel indicated a requirement for portable fuel transfer pumps to facilitate refueling operations from air-delivered containers in forward locations. Authorized tank and pump units were mounted on vehicles and used for Class III support in squadron forward bases and rear areas.

H-17

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## c. Class V Resupply

Class V resupply was accomplished as documented in Figure H-9, section D. Unlike the ACR, three squadrons maintained sizable unit ammunition storage dumps. This was a function of squadron location and, in some cases, the unique type of ammunition used.

## d. Water Resupply

Resupply of water to elements located in the field was considered more efficient by air means. Organic water trailers and 500-gallon collapsible drums were inadequate, due to the limited availability of cargo helicopter sorties. Personnel interviewed expressed a requirement for 55-gallon collapsible drums for water resupply, as these could be carried by utility helicopters. Additionally, commanders and supply officers expressed a requirement for a M50C water truck to facilitate water resupply in rear areas and FSBs. To fulfill this requirement, all units had unauthorized or fabricated water trucks on hand.

## (b) Maintenance Platoon

### 1. Organization

In general, commanders felt that the maintenance platoon organization was adequate. In two squadrons, the entire platoon was located in the rear area, due to its proximity to the squadron AO. Two squadrons had 60 percent and one had 25 percent of the platoon in the squadron forward base. The balance were in the rear areas. There was a corresponding dispersion of vehicles and equipment.

### 2. Personnel

Commanders, motor officers, and technicians expressed concern over the qualifications of turret mechanics, and few mechanics or motor sergeants had experience with the M551 AR/AAV. Several units had experienced severe shortages of trained tracked-vehicle mechanics. They were attempting to overcome this deficiency by OJT. Due to split maintenance operations and density of equipment, the majority of personnel interviewed expressed the requirement for an assistant squadron motor sergeant in the grade of E7.

### 3. PLL and Vehicle Repair

Unlike the ACR, PLLs were maintained at troop level in either the rear area or in semipermanent forward bases. They were seldom moved. Each troop maintained a small supply of high-demand items with the combat elements. As other repair parts were needed they were sent forward with routine resupply. When major repairs were required, the vehicle and crew returned to the location of the squadron maintenance platoon.

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## (c) Medical Platoon

### 1. Organization

The comments contained in paragraph 3b(3), Annex B, pertinent to the platoon's evacuation section and medical evacuation apply.

### 2. Equipment

The M113A1 medical evacuation vehicles were used as described in paragraph 3b(2)(b), Annex B. The squadrons were authorized two such vehicles. The majority of commanders felt that an additional vehicle should be authorized to permit medical support to all three troops. Four of the five squadrons satisfied this requirement by using other M113A1 APC/ACAVs. Additionally, all stated the M113A1 should be authorized the ACAV Armament Subsystem "A" to provide adequate defense for the vehicle and crew.

## (d) Communications Platoon

### 1. General

As in the ACR, the communications platoon concerned itself primarily with the repair of equipment and the management of radio nets. Wire communications nets were little used [see paragraph 3c(1)(d), Annex B]. In most units, commanders and communications officers stated that sufficient test and repair equipment was authorized; however, all stated that repair at the next higher level was slow and unresponsive to their needs. Several officers recommended increasing the authorized level of repair at squadron.

### 2. Personnel

All personnel interviewed stated that the grade of communications chief at both squadron and troop level should be upgraded to E7 to make the rank more commensurate with responsibility and level of expertise required. As contrasted to the ACR, personnel interviewed did not desire to convert the three authorized messengers, who carry the wireman MOS, to radio mechanics, despite the low usage of wire. The messengers had been absorbed into squadron TOCs as radio operators.

## d. Armored Cavalry Troop

### (1) Organization and Operations

The basic TOE organization of the cavalry troop remained

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unchanged except for the deletion of the ground surveillance section. Troops maintained approximately 12 percent of their personnel in the rear area and/or the squadron forward base. The remainder were located in the field. Divisional cavalry troops normally did not establish a static CP when conducting troop- or platoon-sized operations. Rather, the comparatively austere CP group moved with the maneuvering elements. Unlike those in the ACR, the troop CP vehicles were M113A1's. The majority of the commanders interviewed preferred the M113A1 to the M577A1 because the latter presented a more identifiable target. The recovery vehicle did not normally accompany the combat elements. Generally, line troops received a 2 - 3 day maintenance standdown every 2 - 3 weeks.

## (2) Command and Control

(a) During daylight hours, troop commanders were located an average of 83 percent of their time with their command ACAV, 12 percent in the troop CP, and 5 percent in other locations. At night the troop commander operated from his CP, from which he experienced the same command and control problems as discussed for the ACR.

(b) All commanders stated that the quantity and type of radios authorized for command ACAVs were inadequate for effective command and control. As discussed in paragraph 31(2), Annex G, it was considered essential for commanders to be able to maintain continuous communications in two nets.

## (3) Fire Support

The majority of troop commanders stated they were authorized insufficient communications equipment to request and control organic and nonorganic fires. Attached forward observers, who rode on the troop commander's APC/ACAV, were equipped with AN/PRC-25 radios which had inadequate range. As a result, FOs frequently had to use the troop commander's radios to call for and to direct fires. This resulted in the troop commander's losing communication with either his troop or the squadron. All recommended an additional radio on the troop commander's ACAV for use by the FO.

## (4) Armored Cavalry Platoon

### (a) Platoon Tank Section

At the time of the evaluation, three of the five squadrons had exchanged their M48A3 tanks for the M551 AR/AAV. Commanders of units equipped with the M551 stated that this vehicle had significantly increased their overall combat capability, primarily due to its greater cross-country mobility.

H-20

# CONFIDENTIAL

CONFIDENTIAL

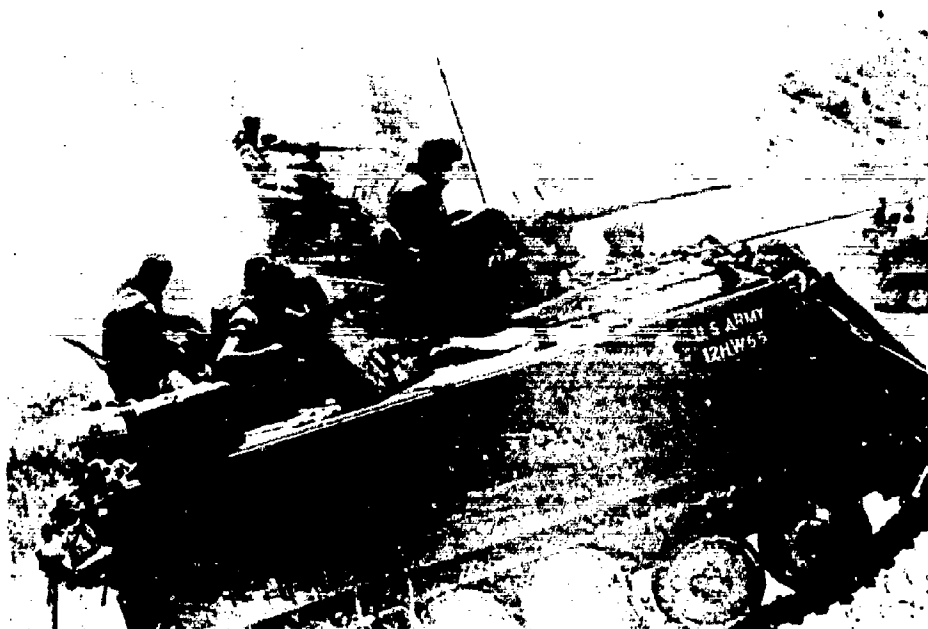


FIGURE H-11 (U). Armored Cavalry Platoon  
in Action.

(b) Infantry Squad

In divisional cavalry squadrons, the infantry squads were distributed among other platoon vehicles as crew fillers; however, in three squadrons they maintained their organizational identity as infantry, and dismounted on call. In other squadrons, they tended to lose their identity. In all units, the infantry M113A1 APC/ACAV became, in effect, another scout vehicle.

(c) Support Squad

There were no significant problems in organization or employment of the mortars which could not be overcome by tailoring assets to meet the requirements of the tactical situation. The majority of troop and squadron commanders preferred the authorized 81mm mortar. The most frequently stated reason was its shorter minimum range for close-in protective fires, and self-illumination. Mortars were retained at platoon level or consolidated at troop level, depending on the situation. None were permanently consolidated at troop or squadron. One unit had no mortars

H-21

CONFIDENTIAL

# CONFIDENTIAL

because a previous commander, feeling them unnecessary, had turned them in. All units experienced a shortage of M125A1 81mm mortar carriers. Several had been issued M106A1 4.2-inch mortar carriers or M113A1's as a substitute. Commanders considered these substitutions inadequate, because the mortars had to be ground-mounted, which decreased responsiveness. During the evaluation period, the squadrons utilized 81mm fires on 74 percent of the days.

## (5) Troop Combat Service Support

No significant organizational problems were noted in the troop combat service support elements. Support personnel were split between the field and squadron forward base, the majority in the latter location. As in the ACR, some squadrons had attached an M548 to each troop; however, no commander felt this a permanent requirement. Maintenance and resupply procedures were as discussed in paragraph 2c(3), above.

## 3. (C) QUANTITATIVE EQUIPMENT PROBLEMS

### a. General

The quantitative equipment problems encountered in the squadrons are documented in this paragraph. Included herein are those subjects on which there was substantial agreement among the commanders and others interviewed. Certain background information is included for subsequent analysis of other issues. Other potential problem areas were addressed during the evaluation, but were discarded after preliminary analysis indicated no justification for further examination. Equipment relating to organizational issues, which were discussed in paragraph 2, above, are included in this paragraph for completeness and reference. The qualitative aspects of equipment are discussed in Annex N. A list of MTOE-authorized equipment considered unnecessary in RVN is included at Appendix 3 to Annex C. No quantitative equipment problems were encountered as a result of variations between units equipped with M48A3 tanks and those equipped with the M551 AR/AAVs.

### b. M113A1 APC/ACAV

Commanders expressed a requirement for an additional M113A1 medical evacuation vehicle for the third line troop (paragraph 2c(3) above).

### c. Bulldozer Requirement

Three of five squadron commanders expressed a requirement for a bulldozer capability. However, there was no unanimity of opinion concerning the specific equipment needed.

### d. Bridging

Commanders expressed a requirement for a bridge section consisting of two bridges and two launchers (paragraph 2c(2), above).

# CONFIDENTIAL

## a. Recovery Vehicles

Divisional squadrons were authorized five M88 VTRs by MTOE. All interviewed regarded this quantity sufficient for operational needs. One squadron had three M578's issued in lieu of the M88. No commanders were familiar with the M113A1 recovery vehicle, XM806E1 (ENSURE 56). Several commanders expressed a need for a recovery vehicle with greater cross-country mobility than the M88 or M578. As in the ACR, the recovery vehicles rarely accompanied combat elements. Based on the TOE/MTOE of the ACR, it was presumed that M551-equipped squadrons would trade some or all of their M88's for M578's.

## f. M548 Tracked Cargo Carrier

In the type operations being conducted during the evaluation, the squadron had an adequate number of M548's.

## g. Wheeled Supply Vehicles

Each squadron considered the authorized quantity of 2 1/2-ton and 5-ton cargo trucks adequate.

## h. Administrative Vehicles

No significant problems were indicated concerning the authorized quantity of administrative vehicles. Vehicles on hand were excess to needs. As indicated in Annex P, the radios from these vehicles were generally removed and employed elsewhere.

## i. Countermining/RPG Equipment

### (1) Countermining Equipment

(a) Commanders were not satisfied with mine detection and detonation equipment. Their statements concerning the adequacy of available equipment and future requirements paralleled those made by commanders in the ACR [see paragraph 31(2), Annex G].

(b) Commanders thought the MTOE authorization of one metallic and one nonmetallic detector per squadron was inadequate. This may have been an error in the MTOE, as the previous MTOE authorized ten metallic detectors per squadron -- also considered inadequate. An increased authorization was thought necessary for the reasons stated in paragraph 31(2), Annex G. The average recommended authorization was ten per cavalry troop and two in HHT, for a total of 32 per squadron. No nonmetallic mine detectors were available in units at the time of the evaluation; and therefore, no data on relative numbers of nonmetallic versus metallic detectors was obtained. As in the ACR, it was recognized that additional handheld mine detectors would provide only a limited solution to the pressing mine

# CONFIDENTIAL

# CONFIDENTIAL

problem. Handheld mine detectors were utilized an average of 64 percent of the days during the evaluation period.

## (2) Belly Armor Kit for M113A1

As indicated in paragraph 2d(1), Annex B, belly armor was considered an excellent passive measure against conventional antivehicular mines.

## (3) Counter-RPG Equipment

All squadrons employed RPG screens in a similar manner and configuration as the ACR [see paragraph 3i(4), Annex G]. Experienced commanders indicated they considered the screens effective; however, casualties still resulted from shrapnel, when missiles exploded on the screen.

## J. Night Vision Equipment

### (1) General

With the advent of new and improved means for night vision, the interrelationships between equipment and usage technique resulted in locally adapted field modifications which had quantitative as well as qualitative impact. The various devices must be considered integral components of a larger system. Therefore, technical modification and/or modified employment technique may be required to optimize the systems effectiveness.

### (2) Searchlights

Although the AN/VSS-3 searchlight had been issued for each M551, it was not authorized in the MTOE. As in the ACR, commanders stated that, as soon as the AN/VSS-3 or a similar type searchlight is type-classified, it should be included in the authorization documents. Additionally, they agreed with the requirement for a silent power source for the searchlights [see paragraph 3j(2), Annex G]. Searchlights were employed on 98 percent of the nights during the evaluation.

### (3) Passive Night Vision Equipment

Commanders were not satisfied with the authorization for passive night vision devices. As compared to regimental squadrons, which were authorized 213 devices, the divisional squadrons were authorized a total of 79 devices: 64 individual starlight scopes and 15 Medium-Range Night Observation Devices (NOD). Units had an average shortage of four starlight scopes and an average excess of 38 crew-served-weapon sights. The average BOI recommended for the entire squadron was 75 individual starlight scopes, 42 crew-served weapon sights, and nine NODs. Commanders

H-24

# CONFIDENTIAL

# CONFIDENTIAL

felt that each troop required 21 individual starlight scopes, 12 crew-served weapon sights, and one NOD, with the remainder located in HHT. All commanders wanted at least one device per tracked vehicle. As in the ACR, these devices were used more for surveillance than as weapon sights. As a result, the smaller, compact, and easier to stow individual starlight scopes were more popular.

## (4) Infrared Equipment

IR equipment was little used, as discussed in paragraph 3j(4), Annex G. The sole exception to this was the AN/VSS-3 searchlight in the IR (pink-light) mode, which was commonly utilized to provide surveillance illumination for passive night devices. Commanders estimated the searchlight was used in this mode 82 percent of the time.

## (5) Night Movement Capability

No equipment authorization inadequacies affected this capability.

## k. Weapons

### (1) General

Commanders were generally satisfied with the various weapons authorized the squadrons, with the exceptions noted below.

### (2) M551/M48A3 Machineguns

The remarks contained in paragraph 3k(2), Annex G apply.

### (3) M551/M48A3 Individual Crewman Weapons

In divisional squadrons, the MTOE authorized four .45-caliber pistols, one M79 grenade launcher, and two .45-caliber submachineguns as individual weapons for each M551/M48A3 crew. All commanders interviewed stated the M79 was an invaluable asset. The majority of commanders stated the two submachineguns should be replaced by one 5.56mm submachinegun per crew. The consensus was that the .45-caliber submachinegun was cumbersome, slow firing, and an unsuitable weapon for close-in protection [see paragraph 3k(3), Annex G].

### (4) Sniper Equipment

Most commanders indicated there was a requirement to have a sniper capability, either organic or provided by higher headquarters.

### (5) Supply Vehicle Weapons

Most personnel interviewed stated the caliber .50 machinegun

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authorized for supply vehicles was a larger weapon than required and recommended its replacement by the M60 machinegun. The justification presented was that the M60 machinegun was more flexible, easier to operate and could be rapidly ground-mounted.

### (6) Machineguns

All squadrons maintained a substantial number of excess machineguns. These weapons were considered essential to meet rear area security requirements without taking weapons out of the combat elements.

### 1. Communications Equipment

#### (1) General

The quantitative adequacy of authorized communications equipment was difficult to assess. In general, squadrons were able to communicate efficiently during the evaluation. However, there was a substantial amount of unauthorized equipment on hand. The communications equipment requirements were a function of the interrelationship between varying operational requirements, time of repair for communications equipment, and equipment usage for purposes other than intended, as depicted in Annex P. The major communications equipment problems are addressed in this paragraph. An analysis of the corporate communications issue is included in Section III.

#### (2) FM Radios

(a) Divisional cavalry squadrons were authorized two TSEC/KY-8 secure speech devices by MFOE. However, as shown in Figure H-12, every squadron had obtained additional secure equipment. Only two squadrons considered the quantity on hand sufficient for command and control. Most commanders felt it essential that every station in the squadron FM command net should have a secure capability.

UNIT	TSEC/KY-8	TSEC/KY-38	TOTAL
1/1 Cavalry	5	16	21
2/1 Cavalry	9	0	9
1/4 Cavalry	14	6	20
3/4 Cavalry	16	0	16
3/5 Cavalry	2	4	6

FIGURE H-12 (C). Secure Equipment On Hand in Divisional Armored Cavalry Squadrons (U).

H-26  
CONFIDENTIAL

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(b) Commanders expressed a requirement for an additional radio with secure equipment for use by the artillery liaison officer [paragraph 2b(2), above].

(c) Commanders expressed a requirement for two receiver-transmitters for all command M113A1 APC/ACAVs down to platoon level.

(d) Commanders expressed a requirement for an additional radio for the troop commanders' ACAVs for use by the artillery FO.

(e) Commanders expressed a requirement for a second AN/PRC-25 radio in each cavalry platoon. The justification was the same as in the ACR [see paragraph 31(2), Annex G].

### (3) AM Radio Equipment

The divisional squadrons expressed concern over the incompatibility between old and new RTT equipment, as discussed in paragraph 31(3), Annex G. However, the quantity of AM radio/RTT equipment authorized by MTOE was considered adequate.

### (4) Rectifiers

All commanders indicated a requirement for two rectifiers per squadron to provide DC power for radios used in FSBs and base camps. The reasons for this requirement are discussed in paragraph 31(4), Annex G. Many of the rectifiers were on hand at the time of the evaluation.

### (5) AB-577 Antenna Base

Squadron commanders expressed a requirement for three AB-577's for the reasons stated in paragraph 31(5), Annex G.

### (6) Communications Nets

The number of nets, and usage of traditional nets varied. Typical radio net requirements with explanatory notes are depicted in Annex P.

### m. Early-Warning Equipment

The quantitative adequacy of radar and early-warning devices was difficult to assess in divisional squadrons due to equipment non-availability, control by higher headquarters, and varying methods of employment.



# CONFIDENTIAL

## (2) Radar Equipment

As indicated in paragraph 2c(2), above, commanders considered the basis of issue of radar sets adequate.

## (3) Early-Warning Devices

Divisional cavalry squadrons were not authorized any type of electronic anti-intrusion devices on their authorization documents; however, most squadrons had a few of the different types on hand. As in the ACR, no data were obtained regarding a desirable basis of issue, as personnel interviewed felt they did not have sufficient experience with these devices. However, commanders expressed a requirement for devices of this nature at platoon level; if they were sufficiently reliable and durable, and simple to operate, emplace, and recover. General comments on these devices were similar to those contained in paragraph 3m(2), Annex G.

## n. Navigational Equipment

The problem and suggested solutions were identical of those discussed in paragraph 3n, Annex G.

## o. Accessory Equipment

### (1) General

Each squadron felt that several accessory items of equipment were needed that were not authorized by the MTOE. Those warranting discussion are considered below. Each squadron also had certain equipment authorized which was not needed. These items are enumerated in Appendix 3 to Annex C.

### (2) Steam Jenny

Commanders and maintenance personnel indicated a requirement for a steam jenny in the squadron maintenance platoon for the reasons stated in paragraph 3o(2), Annex G.

### (3) Air Loading Equipment

No major problems were encountered in this area. Clarification and recognition of USARV authorizations constituted the only major problem.

### (4) Water Resupply Equipment

Commanders and supply officers expressed a requirement for one M50C water truck and nine 55-gallon collapsible drums to facilitate resupply of water [paragraph 2c(3), above].

H-28

# CONFIDENTIAL

# CONFIDENTIAL

## (5) Fuel Transfer Pumps

Personnel interviewed expressed a requirement for five portable fuel transfer pumps per squadron to facilitate field dispensing of air-delivered POL.

## (6) Chain Saws

Commanders expressed a requirement for one chain saw per troop, including HHT. The justification is as indicated in paragraph 3o(6), Annex G.

## (7) On-Vehicle Recovery Equipment

Personnel interviewed were not satisfied with the current BOI of tow cables and tow bars. At the time of the evaluation, units averaged 20 percent of authorized tow cables on hand due to supply system shortages and other problems discussed in paragraph 3o(7), Annex G. Because of the reliance on combat vehicles for field recovery, commanders recommended increasing the authorization for tow cables to two per M113A1-series vehicle and two per M551. They also requested two 50-foot tow cables and one M113 and one M551 tow bar per cavalry platoon. Finally, they were unenthusiastic about sprocket-mounted capstan kits, thinking them too complicated to install and too bulky to carry.

# CONFIDENTIAL

## ANNEX I

### SEPARATE ARMORED CAVALRY TROOPS

#### 1. (C) EMPLOYMENT

##### a. Missions

The roles and missions of separate armored cavalry troops as defined in established doctrine were extensively modified in RVN. During the evaluation, troops were employed either as combat maneuver elements or as security elements. An average of troop commanders' estimates indicated that the troops were under the operational control of a maneuver battalion approximately 80 percent of the time. One troop, Troop A, 4th Squadron, 12th Cavalry, was permanently attached to a tank battalion, [see paragraph 1b(3), Annex J]. See Figure I-1 for locations of the separate cavalry troops. Figure I-2 shows the relative combat strength of each separate troop committed to each type of mission during the evaluation. Mission types have been grouped into broad categories for simplicity and to avoid confusion in terms. Analysis of Figure I-2 shows that, while reconnaissance missions were conducted most frequently by three troops, the other three troops conducted mainly security operations. All troops had a continuing secondary mission of brigade reaction force. As in other cavalry units, commanders felt that security missions did not capitalize on the troop's inherent offensive capability; however, it was conceded that they were the best equipped and organized ground elements in the brigade for such missions.

##### b. Organization for Combat

(1) Figure I-3 depicts the variation in organization for combat and average availability of both organic elements and attachments during the evaluation. As in other cavalry units, platoons were periodically detached, and troops frequently had operational control over infantry platoons. Commanders rarely scrambled their troops; however, attached infantry was customarily distributed throughout the troop to afford the infantry equal mobility and increase the platoons' dismount capability. One commander, whose radar sets were under the operational control of brigade, augmented combat power by attaching the radar and maintenance M113A1 APC/ACAVs to the platoons.

(2) In addition to the organic and attached elements indicated in Figure I-3, the troops also had access to nonorganic fire support. During the evaluation period, the troops received an average of one artillery fire mission every second day and one armed helicopter and one close air support mission every third day.

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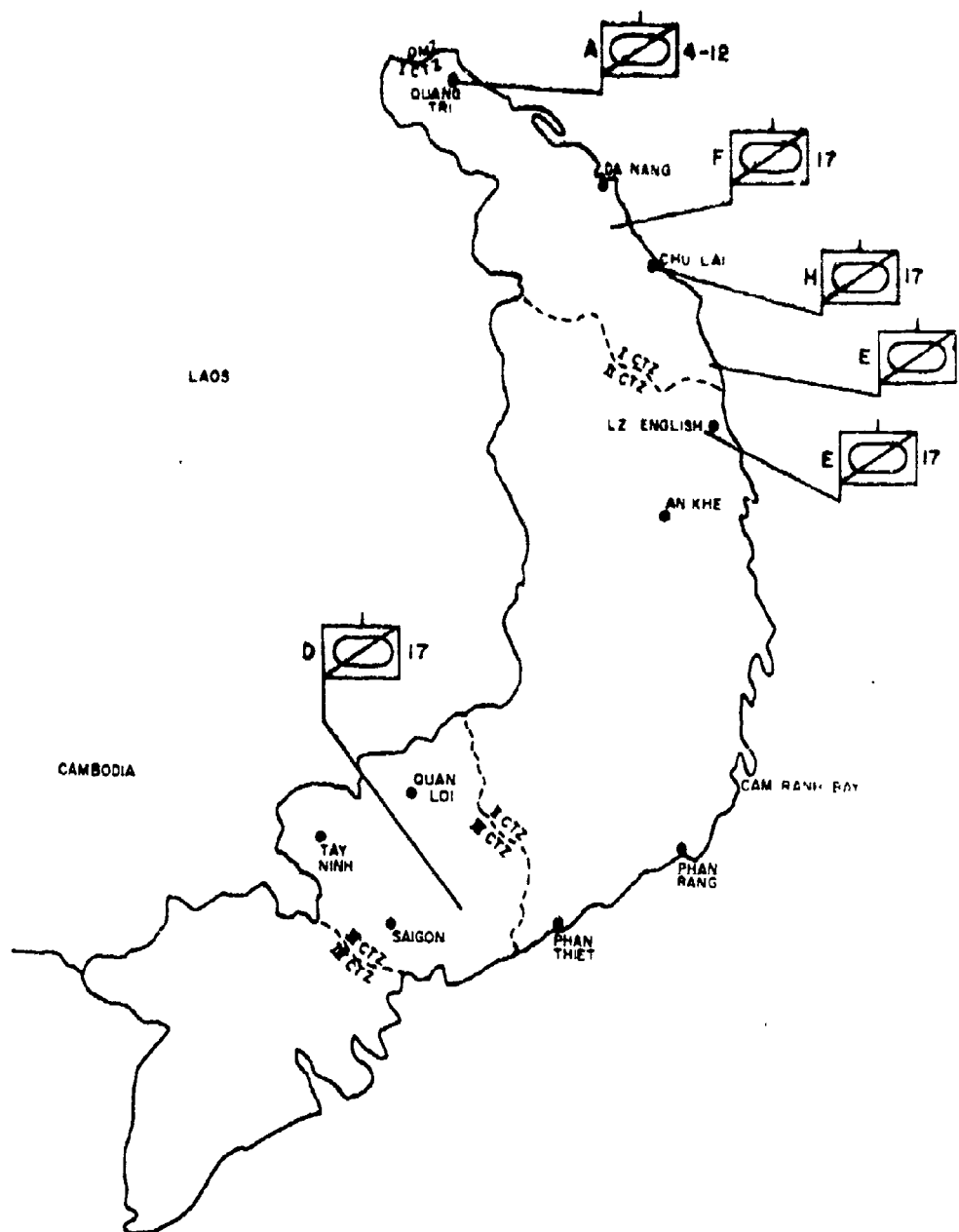


FIGURE I-1 (C). Location of Separate Armored Cavalry Troops During Evaluation. (U)

I-2

**CONFIDENTIAL**

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UNIT	PARENT ORG	DAYLIGHT MISSIONS (1)						NIGHT MISSIONS	
		RECONNAISSANCE OPERATIONS	SECURITY OPERATIONS	READY REACTION FORCE	STAND DOWN & MAINTENANCE	ROAD CLEARING	BASE CAMP SECURITY	NIGHT DEFENSIVE POSITIONS	AMBUSH PATROL AND STRONG POINTS
D/17 CAV	199 LT INF BDE	63%	27%	3%	7%			67%	33%
(2) E/17 CAV	173 ABN BDE	34%	55%	8%	3%	27%		91%	9%
F/17 CAV	196 LT INF BDE	82%	3%	15%				96%	4%
H/17 CAV	198 LT INF BDE	70%	3%	9%	18%		18%	78%	3%
(2) E/1 CAV	11 LT INF BDE	3%	97%			25%	67%	33%	
A/4/12 CAV	1 BDE 5 MECH	25%	68%		7%		81%		19%

## NOTES

- (1) See Glossary of Terms, Annex A, for mission definitions.
- (2) Total percent for unit is greater than 100 percent due to the commitment of combat elements to more than one mission per day.

FIGURE I-2 (C). Average Combat Power Committed to Each Type of Mission, Separate Armored Cavalry Troops. (U)

CONFIDENTIAL

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UNIT	PARENT ORG	CAVALRY PLATOONS			RADAR SETS	GND SURVIVAL MI3AL	INF CO	TANK PLT	INF PLT	ENGR PLT	2 INF SOD	SCOUT DOG TEAM	AVI B	RF/PF		PLT
		1	2	3										1	2	
D/17 CAV	199 7 INF BDE	100%	94%	28%	100%	100%		6%					6%			
E/17 CAV	193 ADN BDE	100%	100%	9%	100%	100%			100%	45%		36%				
F/17 CAV	196 LT INF BDE	100%	100%	93%	*	100%	28%							14%	14%	
H/17 CAV	198 LT INF BDE	100%	100%	90%	0%	100%			5%					5%		
E/19 CAV	191 LT INF BDE	100%	100%	96%	0%	0%					95%					
A/4/12 CAV	180E 5 MECH	100%	100%	67%	100%	100%				44%		44%				

\*Available but not used.

FIGURE I-3 (C). Average Available Combat Power, Separate Armored Cavalry Troops (U).

CONFIDENTIAL

# CONFIDENTIAL

## c. Tactics

### (1) Reconnaissance Operations

Reconnaissance operations were conducted using formations, battle drills, and techniques similar to those employed by other cavalry units in RVN. Three commanders normally assigned each platoon a separate AO in order to perform the numerous assigned tasks. Two units conducted troop-size operations almost exclusively. Annex F contains summaries of operations conducted at the time of the evaluation and graphic illustrations of troop AOs. Commanders estimated that some type of dismounted reconnaissance operation was conducted on an average of every fourth day. As in the ACR, dismounted elements rarely moved far from their vehicles.



FIGURE I-4 (U). Separate Armored Cavalry Troop Reconnaissance Operations.

### (2) Security Operations

Troops performed some type of security mission almost daily; however, the percentage of combat power committed differed significantly, as indicated in Figure I-2. The most commonly assigned security missions were fixed installation and route security. One unit had a long-

I-5

# CONFIDENTIAL

## CONFIDENTIAL

standing daily mission of opening and securing QL-1 from the brigade base camp to the CTZ boundary. Techniques employed to accomplish these missions were generally similar to those used by the ACR.

### (3) Night Operations

Commanders' estimates indicated that the troops conducted some type of mounted night movement on an average of 10 percent of the nights. These moves were mainly to insert ambush patrols, to establish strong points, or to react to enemy activity. Techniques used were similar to those employed by other cavalry units. The relative amount of combat power committed on an average night to ambush patrols and strong points is indicated in Figure I-2.

#### d. Enemy Contact

(1) The level of conflict encountered by the separate cavalry troops throughout the 40-day data collection period was low. Contact was established on the average of every fourth day. Of these contacts, 52 percent were squad size or smaller, 20 percent platoon size, and the remainder unknown. Twenty-four percent of the contacts were US initiated and the remainder, enemy initiated. Of the enemy initiated contacts, 35 percent were sniper attacks, 35 percent indirect fire attacks, and 30 percent ambushes. The contacts averaged one enemy KIA and one captured.

(2) Mining activity in separate troop AOs was low as compared to the other armored units. During the data collection period, only six mines were reported, all of which were detected without vehicle damage. Four of the mines were found on trails and roads. Contrary to other cavalry units' experiences, separate troops had more RPG than mining incidents during the evaluation. In 42 reported RPG incidents, two vehicles were hit, causing light damage to one and destroying the other. An estimated twenty-five percent of RPGs were aimed at trees near the vehicle, apparently in an attempt to inflict shrapnel casualties on personnel riding on top of the vehicles. Even though RPG incidents were more frequent than mine incidents, most commanders felt the mine threat to be the more serious.

## 2. (C) ORGANIZATION

### a. General

#### (1) Introduction

The organizational problems encountered in separate armored cavalry troops organic to light infantry and airborne brigades are documented in this paragraph. Included herein are only those issues on which there was substantial agreement among the commanders and others interviewed. Where an organizational problem has an implied equipment impact,

I-6

CONFIDENTIAL



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the latter is concurrently discussed. Quantitative equipment problems are discussed in paragraph 3, below and the qualitative aspects of equipment are discussed in Annex N. A/4/12 Cavalry, the troop attached to the tank battalion, was not subject to many of the problems documented in this paragraph, because it was adequately supported by the unit to which attached. A/4/12 is not considered in the discussion below.

### (2) Organizational Mix

Separate cavalry troops were organized under the same TOE as cavalry troops in the ACP. All commanders interviewed were generally satisfied with the mix of troop combat elements. However, all felt there was a serious lack of service support capability that would normally be provided to troops organic to a squadron.

#### b. Troop Headquarters

##### (1) Command and Control

Separate cavalry troop commanders experienced additional command and control problems not encountered by other troop commanders. These problems were caused by the separate status of the troops.

##### (a) Adequacy of Communications Equipment

Commanders unanimously stated that the quantity and type of radios authorized for command M113A1 ACAVs were inadequate for effective command and control [see paragraph 31(2), Annex G]. It was considered essential for commanders to maintain continuous communications in two nets. Additionally, all commanders expressed the requirement for one additional radio in the troop commander's vehicle for use by the forward observer or the troop commander to request and control supporting artillery fires.

##### (b) Troop Command Post Operations

Each troop was authorized an M577A1 command post carrier. Every commander but one positioned this vehicle in a fire support base or other secure area in close proximity to the unit AO. The CP vehicle was used as a troop operations center and a forward administrative and logistical base. Normally it was staffed by the troop liaison sergeant, radio operators, a driver, and a liaison agent. A portion of the troop maintenance section was collocated with the forward CP. Additionally, each troop was required to maintain another 24-hour radio station at the brigade base. This was generally supervised by the troop executive officer or first sergeant, and radio operators were provided from administrative vehicle drivers and line platoon personnel. All commanders felt that these requirements exceeded authorized capabilities. The most frequently recommended

CONFIDENTIAL

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solution to the above problems was addition of an E6 operations sergeant, one radio operator and additional radios.

## (2) Dispersion and Rear Area Requirements

The majority of the troops maintained personnel and equipment in three locations. Troops averaged 15 percent of their personnel in the brigade base, 10 percent in the forward CP, and 75 percent with the combat elements. It is interesting to compare these percentages with those for cavalry troops in the ACR and divisional squadrons. Those units averaged approximately 90 percent of their personnel with the combat elements. Only one troop had a major base defense mission requirement. It permanently provided three 4.2-inch mortars and crews, less carriers, to brigade for base defense. The troop had been issued three additional 81mm mortars, which were carried in M106A1 carriers. Crews were provided from the troop.

### c. Troop Combat Support

#### (1) Ground Surveillance Section

(a) Troops were authorized two AN/PPS-5 radar sets.

Figure I-5 indicates the radars which were on hand in each troop. Units which had operational radar sets employed them on the average of 45 percent of the nights. Actual employment consisted of: ambushes, 26 percent; NDPs, 34 percent; and 40 percent in base areas. One troop commander indicated he was seldom able to employ his radars, due to limited fields of observation in his AO.

UNIT	PARENT ORG	PPS-5		PPS-4	
		AUTH	C/H	AUTH	C/H
D/17 CAV	199 LT INF BDE	2	0	0	2
E/17 CAV	173 ABN BDE	2	0	0	1
F/17 CAV	196 LT INF BDE	2	0	0	0
H/17 CAV	198 LT INF BDE	2	2	0	0
E/1 CAV	11 LT INF BDE	2	1	0	1

FIGURE I-5 (U). Radar Equipment  
Authorized and  
On Hand.

I-8

# CONFIDENTIAL

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(b) Figure I-6 shows the headquarters which controlled employment, method of employment, and movement of the radars. The radars and operators from two troops were permanently under brigade control. In one troop, this included the radar section's two M113A1 APC/ACAVs. As with other armored units in RVN, only limited results were obtained from radars, and problems were encountered with equipment failures, time of repair, and the availability of trained operators. Commanders felt, however, that the BOI was adequate for assigned missions.

UNIT	PARENT ORG	CONTROL HQ		EMPLOYMENT		MOVEMENT	
		TRP	BDE	STATIC	MOBILE	M113A1 APC/ACAV	NOT MOVED
D/17 CAV	199 LT INF BDE	X			X	X	
E/17 CAV	173 ABN BDE	X			X	X	
F/17 CAV	196 LT INF BDE	NOT		ISSUED			
H/17 CAV	198 LT INF BDE		X	X			X
E/1 CAV	11 LT INF BDE		X	X			X

FIGURE I-6 (U). Radar Control, Employment and Method of Movement.

## (2) Requirement for a Bridge Capability

Separate cavalry troops were not authorized an organic bridge capability and, generally, none was available from brigade. All commanders but one expressed a need for a bridge capability. The one dissenting commander felt that this capability was not necessary as his unit was permanently involved in road security. One troop had acquired an AVLB, which the commander felt fulfilled the need.

### d. Troop Combat Service Support

#### (1) Introduction

Most problems encountered in cavalry troops organic to light infantry and airborne brigades were in the combat service support area. The support elements of light infantry and airborne brigades were understandably oriented to the support of infantry and artillery units and equipment. This resulted in the cavalry troops performing higher support level services in addition to normal troop level administrative, logistical, and maintenance operations. To accomplish these tasks, each troop had acquired varying amounts of unauthorized equipment.

# CONFIDENTIAL

## (2) Troop Supply Functions

### (a) Operations

Separate cavalry troops drew various classes of supplies from several locations, as indicated in Figure I-7, Section A. Four of the five troops established a logistical base with their forward CP. The average distance from the brigade base to the forward CP was 32 kilometers. Method and frequency of supply movement between brigade base and forward area is documented in Figure I-7, Section B. Most units had acquired additional vehicles, as indicated in Figure I-7, Section C. Two troops resupplied combat elements overland and three resupplied by air. Items provided, method of transport, and frequency of resupply to the combat elements in each troop, is summarized in Figure I-7, Section D. Units effected their own Class III resupply using unauthorized equipment, since they were authorized no POL handling equipment. Class III handling equipment acquired and the resupply procedures used are depicted in Figure I-7, Section E. Air delivered POL was transferred from bladders to vehicles using techniques described in paragraph 2d(3), Annex G.

### (b) Supply Organization

1. Troops were authorized a supply sergeant, supply specialist, and a 2 1/2-ton truck with trailer, to accomplish resupply. As contrasted to a troop organic to a squadron, separate troops were required to maintain a property book with registers and files, as well as requisition, pick up, and deliver all classes of supplies. In addition, troop supply was responsible for the repair and evacuation of small arms, maintenance of the unit ammunition supply point, and laundry service. Troop supply was supervised by the executive officer and was located in the brigade base in close proximity to supply sources.

2. All troops had formed provisional sections to augment authorized supply personnel. These sections were utilized to pick up and deliver supplies. They also prepared air loads. In all cases, the additional personnel were diverted from combat elements. None of the commanders were satisfied with this arrangement. All commanders recommended the addition of a resupply section, consisting of an E5 assistant supply sergeant, an armorer, and three truck drivers. Equipment requested was an additional 2 1/2-ton truck or M548 for general resupply transport, one 5-ton truck with tank and pump unit for POL transport, and four 500-gallon drums for air POL resupply.

## (3) Troop Maintenance Section

### (a) Vehicle Maintenance

#### 1. Operations

Most troop maintenance sections provided one mechanic to each platoon. The remainder of the section was located in either the

I-10

CONFIDENTIAL

			D/17 Cav	E/17 Cav	F/17 Cav	H/17 Cav	I/17 Cav
			199th Lt Inf Bde	173d abn Bde	196th Lt Inf Bde	19th Lt Inf Bde	11th Lt Inf Bde
A	Classes of Supplies and Location Drawn	Depot	M551 Main Gun, VII	None	II, rackage III, IV, V, VII	VII	VII
		Distance Depot to Bde Base	5 Km	N/A	35 Km	2 Km	25 Km
		Brigade Base	I, II, III, IV, V	I, II, III, IV, V, VII Water	I, Bulk III, Water	I, II, III, IV, V, Water	I, II, III, IV, V
		Distance Bde Base to Troop Forward Base	70 Km	16 Km	Collocated	20 Km	25 Km
B	Method of Transport to Troop Forward Base and Frequency	Air	None	None	No Forward Base	3 UH1 Sorties Daily, 1 CH47 Sortie every 3rd Day	None
		Ground	Organic Transportation Daily	Organic Transportation Daily	No Forward Base	Organic Transportation as Required	Organic Transportation Daily
C	Unit Supply Vehicles Available	M55 24-Ton Truck (1 Supply, 1 Mess)	2	5	2	2	3
		M548 (None Authorized)	0	0	2	1	1
D	Method of Transport to Combat Elements	Air	1 CH47 Sortie Daily, 2 Every 3rd Day	None	3 UH1 Sorties Daily, 1 CH47 Every 3rd Day	2 UH1 Sorties Daily, 1 CH47 Sortie Every 3rd Day	None
		Percent	70%	0%	80%	95%	0%
		Ground	Max use of Combat Vehicles Returning From Maintenance	Convey of 2-4 Trucks to Forward Base Daily, Platoons Return Daily	Max use of Combat Vehicles Returning From Maintenance	Max use of Combat Vehicles Returning From Maintenance	1 Flat Tied in Troop Rear, 2 Vehicle Convey Daily to Troop Forward Base
E	Unit Class III Equipment and Resupply Procedures Note: No Equipment Was Authorized	Vehicles	None	1 M49C Daily to Forward Base	None	None	1 1/2-Ton Trailer with 600-Gallon Tank Daily to Combat Elements
		Equipment	2 500-Gallon Cinders By Truck From Bde Base to Forward Base, 1 CH47 Sortie Every 3d Day to Combat Elements	None	2 500-Gallon Cinders From Bde Base by CH47 to Combat Elements Every 3rd Day	2 500-Gallon Cinders From Bde Base by CH47 to Combat Elements Every 3rd Day	None

FIGURE I-7 (U). Resupply Operations, Separate Armored Cavalry Troops.

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FIGURE I-8 (U). Air Resupply to Separate Armored Cavalry Troop.

forward CP or rear area. Recovery vehicles normally did not accompany combat elements. In two units, the maintenance M113A1 APC/ACAV accompanied the combat elements; in one unit it was located with the forward CP; and in one unit it was in the brigade base. One commander had assigned it to a platoon as a fighting vehicle. In all units but one, PLL was maintained in the brigade base and was rarely moved. One troop carried its PLL in an excess 2 1/2-ton truck which was normally positioned with the forward CP. A small number of high-demand parts were carried with the combat elements. As repair parts were required, they were sent forward with routine resupply. Troops performed periodic maintenance services, normally a squadron maintenance platoon responsibility, due to their independent status. All units performed some DS-level repairs.

## 2. Organization

Separate cavalry troops were authorized essentially the same personnel and equipment found in the cavalry troops of the ACR. Commanders were dissatisfied with this organization and felt a requirement existed for additional personnel and equipment. The most frequently expressed need was for the addition of a maintenance warrant officer, one additional turret mechanic, and a welder. Commanders felt a full-time maintenance officer was required to permit the troop executive officer to fulfill demands placed on him as the unit's administrative and logistics operator. Equipment desired is considered in paragraph 3k, below.

I-12

CONFIDENTIAL

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## (b) Communications Maintenance

### 1. Operations

The troop communications chief traveled between the forward CP and brigade base, overseeing maintenance. Normally, one radio mechanic accompanied the combat elements and one was located in either the forward CP or rear area. Equipment requiring higher level repair was transported from the forward area to the brigade base and turned in to DS maintenance or a contact team. All commanders felt the system was inadequate and that DS-level repair was slow and unresponsive to troop needs. As in other units, separate troops maintained varying quantities of unauthorized communications equipment, which commanders felt was essential in order to maintain continuous radio communications.

### 2. Organization

Separate troops were authorized an F5 communications chief and two radio mechanics. All commanders felt an additional radio mechanic was needed in order that expanded maintenance functions of a separate troop might be adequately performed. Commanders also agreed that the level of the communications chief should be raised one grade to make the rank more commensurate with the responsibility and degree of expertise required.

## (4) Troop Administration

Separate armored cavalry troops were required to perform many administrative functions normally performed at squadron level. In order to accomplish these tasks, all troops employed a second clerk drawn from unit resources. All commanders and first sergeants expressed a requirement for a second troop clerk.

## (5) Medical Support

Troops were provided medical support from brigade assets. In most units, this consisted of four medical aidmen. Normally one aidman was assigned to each platoon and one to troop headquarters. Each commander felt his support was adequate.

## e. Armored Cavalry Platoon

### (1) Organization

At the time of the evaluation, the basic TOE organization of the cavalry platoon remained unchanged. When these units were deployed to RVN, the platoon tank section had been deleted, and an additional scout squad (two M113A1 APC/ACAVs) had been added. However, with the deployment of the M551 to RVN, the troop tank sections were reinstated in the standard cavalry configuration. Commanders generally felt the M551, with greater firepower than the ACAV, had increased their overall combat capability.

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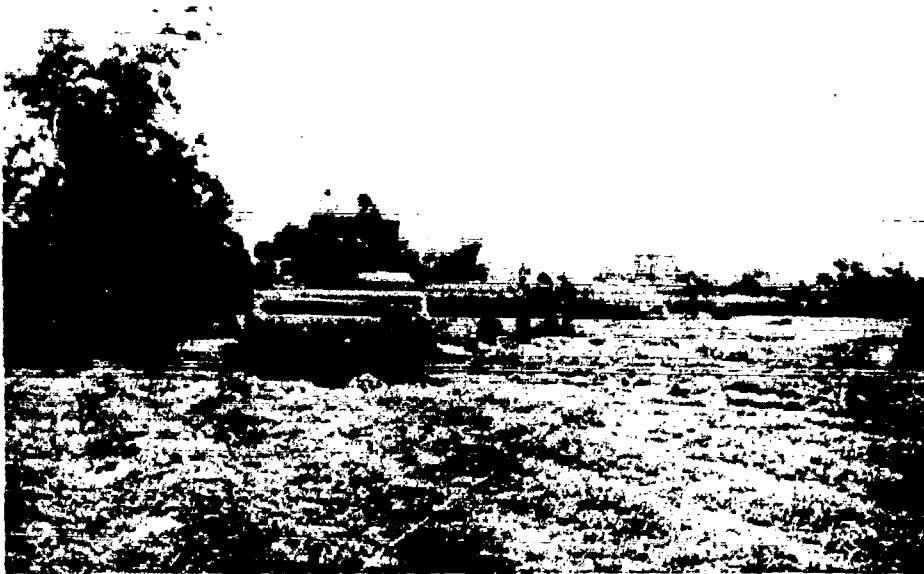


FIGURE I-9 (U). M551 AR/AAVs Employed with M113A1 APC/ACAVs in Armored Cavalry Platoon.

## (2) Platoon Tank Section

As in other cavalry units in RVN, M551's of separate troop tank sections were not employed in their conventional role. Rather, the vehicles were intermingled among other platoon vehicles in order to distribute their firepower. This created no organizational problem.

## (3) Infantry Squad

In two troops, the infantry squads were distributed among platoon vehicles as crew fillers and had lost their identity, as described in paragraph 3b(2)(d), Annex B. In the remaining troops, they partially retained their organizational identity, dismounting occasionally on call. In all units, the infantry M113A1 APC/ACAV had become, in effect, another scout vehicle.

## (4) Support Squad

There were no significant problems in organization or employment of the mortars which could not be overcome by tailoring assets to meet tactical requirements. All commanders preferred the authorized 81mm mortar because of its shorter minimum range. As in divisional cavalry squadrons and mechanized infantry units, most troops experienced a shortage of M125A1 81mm mortar carriers. Several had been issued the M106A1 4.2-inch mortar carrier or the M113A1 as a substitute. Commanders considered these substitutions unsatisfactory.

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## 3. (C) QUANTITATIVE EQUIPMENT PROBLEMS

### a. General

The quantitative equipment problems encountered in separate armored cavalry troops organic to light infantry and airborne brigades are documented in this paragraph. Included herein are those subjects on which there was substantial agreement among commanders and others interviewed. As an exception to this, certain background information is included for subsequent analysis of other issues. Other potential equipment problem areas were considered during the evaluation, but discarded after analysis indicated no justification. Equipment problems relating to major organizational issues, which were discussed in paragraph 2, above, are summarized in this paragraph for completeness and reference. The qualitative aspects of equipment are discussed in Annex N. A list of MTOE-authorized equipment considered unnecessary by commanders in RVN is included at Appendix 3 to Annex C.

### b. Combat and Combat Support Vehicles

All commanders expressed satisfaction with the authorized quantity of combat and combat support vehicles.

### c. Recovery Vehicles

There was an MTOE contradiction in the type recovery vehicle authorized for separate troops. The MTOE summary document authorized an M88 VTR, whereas the MTOE and TOE detail documents authorized an M578 LTR. All units had an M578 on hand and commanders generally considered this vehicle to be adequate. Recovery vehicles rarely accompanied combat elements. As in the other cavalry units, they were used primarily for heavy lift and other maintenance requirements. Of those vehicles recovered during the evaluation period, only 10 percent were retrieved by the M578.

### d. Supply Vehicles

All commanders expressed a requirement for an additional 2 1/2-ton supply vehicle, as discussed in paragraph 2d(2), above.

### e. Countermine/RPG Equipment

#### (1) Vehicle Mounted Countermine Equipment

Commanders expressed dissatisfaction with mine detection equipment. Their statements concerning the adequacy of available equipment and future requirements paralleled those made by commanders in the ACR [see paragraph 3i(2), Annex G].

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## (2) Hand-Held Mine Detectors

Separate cavalry troops were authorized three metallic mine detectors. Troop commanders felt this BOI was adequate for current operational requirements. As nonmetallic detectors were not authorized or on hand, no quantifiable data on relative numbers of nonmetallic versus metallic detectors was obtained.

## (3) Belly Armor Kit for M113A1 APC/ACAV

As indicated in paragraph 2d(1), Annex B, belly armor was considered an excellent passive measure against conventional antivehicular mines. Most units had been issued only a few kits, and all commanders felt kits were needed for all M113A1-family vehicles.

## (4) Counter-RPG Equipment

All troops employed RPG screens in a manner and configuration similar to the ACR [see paragraph 3i(4), Annex G].

### f. Night Vision Equipment

#### (1) Searchlights

Commanders were satisfied with the BOI of the AN/VSS-3 searchlight. The remarks contained in paragraph 3j(2), Annex H, apply.

#### (2) Passive Night Vision Devices

There was an apparent MTOE discrepancy in the quantity and types of passive night vision devices authorized. The MTOE summary document authorized 29 individual starlight scopes, and 27 crew-served night weapons sights. The MTOE detailed distribution document authorized 20 and 36 respectively. Commanders generally felt the former authorization was excellent, as it allowed one crew-served night weapon sight per fighting vehicle. Each troop was authorized three night observation devices, medium range (NOD); however, only one unit had one on hand. Commanders indicated a preference for the individual weapon sights, as they were easier to handle and stow. These devices were employed as discussed in paragraph 3j(3), Annex G.

#### (3) Infrared (IR) Equipment

IR equipment was seldom used as discussed in paragraph 3j(4), Annex G. The sole exception was the AN/VSS-3 searchlight in the IR (pink-light) mode, which was commonly utilized to provide surveillance illumination for passive night vision devices.

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## (4) Night Movement

No equipment inadequacies were encountered that affected this capability.

## g. Weapons

### (1) General

Commanders were generally satisfied with the various weapons authorized, except as noted below.

### (2) M551 Machineguns

The remarks contained in paragraph 3k(2), Annex G apply.

### (3) Sniper Equipment

Most commanders indicated there was a requirement for this capability.

### (4) Supply Vehicle Weapons

Commanders recommended that the M60 machinegun replace the authorized caliber .50 M2, HB machinegun on supply vehicles, as discussed in paragraph 3k(5), Annex H.

### (5) M577A1 Weapons

All commanders indicated a requirement for the M577A1 command post carrier to be authorized an M60 machinegun with mount and ballistic shield for local security and self-defense during displacement.

## h. Communications Equipment

### (1) General

The quantitative adequacy of authorized communications equipment was difficult to assess. The troops were generally able to maintain effective communications. However, as indicated in paragraph 3c(1)(d), Annex B, there was a substantial amount of unauthorized equipment on hand. The communications equipment requirements were a function of the inter-relationship between the effectiveness of communications equipment maintenance support, varying operational requirements, and equipment usage for purposes other than intended, as depicted in Annex P. The major communications equipment problems are addressed in this paragraph.

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## (2) FM Radios

### (a) Command M113A1 APC/ACAV Radios

Commanders expressed a requirement for two receiver-transmitters for all command M113A1 APC/ACAVs down to platoon level [see paragraph 2b(1), above].

### (b) Fire Support Communication Equipment

Separate cavalry troops were infrequently provided forward observers. As a result, commanders were normally required to call for and adjust their own artillery fires. To enter the artillery net, commanders had to leave either the troop or the higher headquarters command net. This was very undesirable. When FO teams were attached, they were only equipped with an AN/PRC-25 radio, which was inadequate. Most commanders felt that an additional AN/VRC-46 was required on the troop commander's M113A1 APC/ACAV for fire support coordination.

### (c) M577A1 CP Vehicle Radios

The M577A1 CP vehicle was authorized an AN/VRC-47 radio. All commanders felt this was insufficient for forward CP operational requirements. This CP was normally required to operate continuously in three nets, and was frequently required to be active in a fourth, (see Annex P). This requirement resulted from the unit's separate status and from evolved methods of operation, as discussed in paragraph 2b(1), above. The most frequently recommended solution was the addition of an AN/VRC-46 radio.

### (d) Rear CP Radio

All troops were required to operate a base radio station in their rear CP at the brigade base. This station was generally required to operate in two nets continuously. No equipment was authorized for this purpose. As a result, most units utilized an unauthorized AN/VRC-47. All commanders felt this radio should be authorized.

### (e) Cavalry Platoon Radios

Commanders expressed a need for a second AN/PRC-25 radio in each cavalry platoon for dismounted and night employment. Other justification was the same as that included in paragraph 31(2), Annex G.

### (f) Secure Equipment

Separate troops were not authorized secure radio equipment; however, all troops were required to operate in the higher headquarters secure command net. Units were issued this equipment by the brigade signal officer. All commanders expressed a requirement for sufficient secure equipment to equip the troop CP vehicle and commander's M113A1 APC/ACAV.

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## (3) AM Radio Equipment

The authorized AN/GRC-106 was not utilized by any unit. Commanders generally felt it should be deleted from the MTOE.

## (4) Rectifiers

Personnel interviewed expressed a requirement for one AC-to-DC rectifier to provide power for the rear CF base radio station. Reasons stated were the same as those discussed in paragraph 31(4), Annex C.

## (5) Communications Nets

The number of nets and usage of traditional nets varied. The average radio net requirements with explanatory notes are depicted in Annex P.

### i. Early Warning Equipment

As indicated in paragraph 2c(1), above, commanders considered the basis of issue of radar sets adequate. Separate cavalry troops were authorized 12 electronic anti-intrusion detector sets, AN/PSR-1; however, none were on hand. As a result, there was insufficient experience on which to recommend a BOI change.

### j. Navigational Equipment

The problem and suggested solutions were identical to those discussed in paragraph 3n, Annex G.

### k. Accessory Equipment

#### (1) General

Each troop commander felt several accessory items of equipment were needed which were not authorized by MTOE. Those warranting discussion are considered below. Concurrently, each troop had certain items authorized which commanders felt were not required. These items are enumerated in Appendix 3 to Annex C.

#### (2) Class II Handling Equipment

##### (a) POL Truck

Separate cavalry troops were not authorized a POL transport capability. All commanders expressed a requirement for a 5-ton truck with tanks and pump unit to meet this need [see paragraph 2d(2), above].

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## (b) 500-Gallon Collapsible Drums

Separate troops were not authorized equipment for air delivery of POL; however, units delivered POL by air extensively. All commanders expressed a requirement for 500-gallon drums. The average recommended BOI was four per troop. Commanders felt this quantity was required, as all units had experienced continuing problems with back-haul of these items.

## (c) Fuel Transfer Pumps

Units were not authorized equipment to enable them to transfer fuel from air-delivered drums to vehicles. All persons interviewed felt that portable fuel transfer pumps were needed, on the basis of one pump for each platoon.

## (3) Water Resupply Equipment

Most commanders felt the one authorized water trailer was insufficient for resupply of combat elements. The majority of units accomplished water resupply using unauthorized 55-gallon collapsible drums transported by UH-1 helicopters. Commanders expressed a requirement for six 55-gallon water drums per troop. As with the 500-gallon collapsible drums, this quantity was considered necessary because of back-haul problems.

## (4) Requirement for a Bridge Capability

As discussed in paragraph 2c(2), above, most commanders indicated a requirement for organic bridging; however, there was no consensus as to desired type. Some felt the AVLB would be suitable; however, others thought an organic bridge required mobility equal to that of other troop vehicles. None of the commanders desired the marginal terrain assault bridge (MTAB) (ENSURE No. 84). This item of equipment had been previously evaluated by ACTIV and was found deficient on several counts.

## (5) Chain Saws

Commanders expressed a requirement for one chain saw per troop. The justification is as indicated paragraph 3c, Annex G.

## (6) On-Vehicle Recovery Equipment

The problem stated in paragraph 3c(7), Annex G applies to the separate cavalry troops. To solve this problem, personnel interviewed felt that a second tow cable was required for all tracked vehicles, as well as two 50-foot tow cables, one M113/1 tow bar, and one M551 tow bar per cavalry platoon.

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## (7) Number Two Common Tool Set

As discussed in paragraph 2d(3), above, commanders felt there was a requirement for additional equipment for the maintenance section. Most frequently recommended was deletion of the number one common tool set and supplement, and addition of the number two common tool set and supplement. Commanders felt this was necessary as the troops required tools to perform all maintenance functions normally performed by a squadron maintenance platoon.

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## ANNEX J

### TANK BATTALIONS

#### 1. (C) EMPLOYMENT

##### a. Missions

The missions assigned to tank battalions were typical of missions assigned to all mechanized and armored units in RVN. Battalions operated for extended periods in relatively fixed AOs, and assigned missions generally recognized seasonal limitations on the cross-country mobility of the M48A3 tank. The RVN environment offered little opportunity to employ these units in their traditional roles of exploitation and envelopment. Missions assigned the three battalions varied considerably due to extreme differences in terrain, vegetation, and enemy threat in their respective AOs. Figure J-1 shows the location of tank units in RVN at the time of the evaluation. Figure J-2 shows the relative commitment of the combat strength of each battalion to each type of mission during the evaluation. Because of the wide variations in local techniques and terminology, types of missions have been grouped into broad general categories for clarity. At all times, armored units had the secondary mission of acting as reaction forces. While two battalions concentrated on reconnaissance operations, the third was used primarily for security of its parent division's main supply route (MSR). The relatively high commitment of the three battalions to security operations was a function of the requirement to secure ground lines of communication and fixed installations, and a recognition of the fact that the tank battalion could perform this mission with a minimum of support. While acknowledging the necessity for security operations, commanders generally believed that these missions did not make use of the battalions' inherent offensive capability. Regardless of the type of mission assigned, emphasis was placed on small-unit combined operations whose purpose was improving the combat capability of ARVN and local PF and PF units.

##### b. Organization for Combat

(1) Doctrinally, heavy tank/infantry teams are most effective against insurgent forces, as such teams provide the necessary dismounted elements essential for finding and fixing the enemy. As a result, task organizing was essential for accomplishment of most missions. Each of the tank battalions operated in a different Corps Tactical Zone under a different US division/brigade headquarters. As a result, there was no uniformity in task organization. Figure J-3 depicts the variation in organization for combat and average availability of both organic elements and attachments during the evaluation. Because of these variations in available assets, each battalion's organization for combat is described separately below.

J-1

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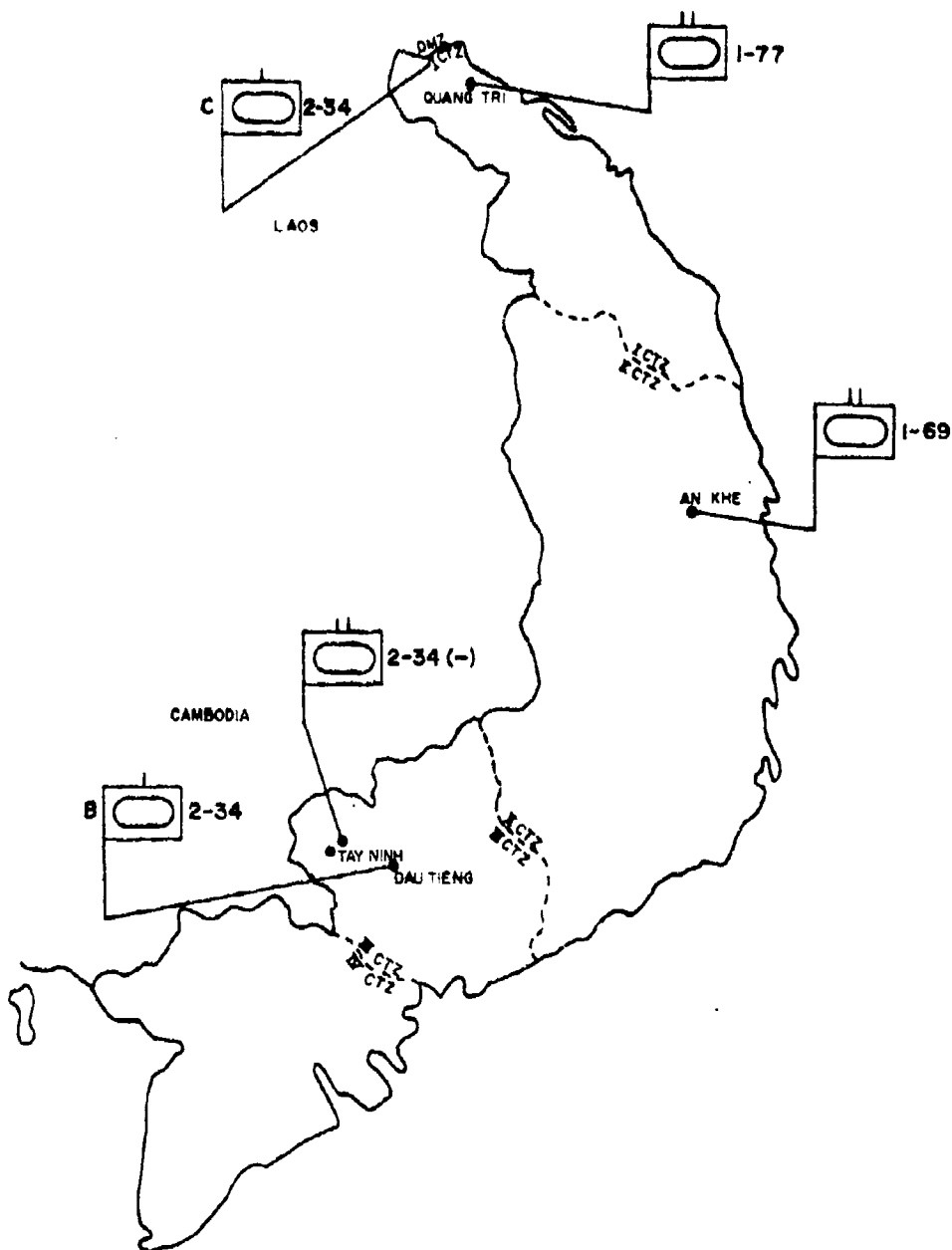


FIGURE J-1 (C). Location of Tank Elements During the Evaluation. (U)

J-2

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UNIT (2)	DAYLIGHT MISSIONS (1)								NIGHT MISSIONS	
	RECONNAISSANCE OPERATIONS	SECURITY OPERATIONS	RAPID REACTION FORCE	MAINTENANCE STANDDOWN	ROAD CLEARING	OTHER MISSIONS	NIGHT SECURITY	NIGHT DEFENSIVE POSITIONS	NIGHT AMBUSH AND PATROLS	
1/69 Δ	12%	55%	29% (3)	5%	26%	0%	65%	14%	20%	
1/77 Δ	54%	6%	0%	30%	5%	17% (4)	70%	18%	12%	
2/34 Δ	69%	32%	0%	8%	28%	0%	35%	14%	53%	

## NOTES:

1. See Glossary of Terms, Annex A, for mission definitions.

2. Total percent is greater than 100% due to the commitment of combat elements to more than one mission per day.

3. Maintenance standdown platoon was secondary reaction force and used frequently during period.

4. Movement to new AO and time spent improving and building local defenses in new area.

FIGURE J-2 (C). Average Combat Power Committed to Each Type of Mission, Tank Battalions (U).

J-3

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4-J

UNIT	ORGANIC COMBAT ELEMENTS							ATTACHED				OPCON COMBAT ELEMENTS						MISCELLANEOUS COMBAT ELEMENTS					RF UNITS	
	ONE TANK COMPANY	TWO TANK COMPANIES	THREE TANK COMPANIES	BN SCOUT PLATOON	BN MORTAR PLATOON	NO TANK SECTION	CAVALRY TROOP	ONE MECH INF CO	TWO MECH INF CO	ONE MECH INF CO'S	ONE INFANTRY CO	ONE MECH INF PLT	ONE INFANTRY PLT	ENGINEER PLATOON	ENGINEER SWEEP TEAMS	SNIPER TEAMS	SCOUT DOG TEAMS	AIR CAV LT FIRE TEAM	M42 DUSTER PLT	CE V	ONE RF COMPANY	TWO RF COMPANIES		
1/69A	100	100	0(2)	100	100	0	100	0	33	0	0	100	100	100	0	0	20	100	0	0	0	0	0	10
1/77A	100	0	0	100	100	100	76	6	28	0	0	0	0	44	0	44	0	0	44	30	10	0	0	
2/34A	94	0	0	100	94	0	0	0	0	44	19	0	100	0	0	0	0	0	17	80	5	0	0	

NOTES:

1. All figures are percentages based on available platoons.
2. The battalion always detached one tank company (-) retaining one tank platoon to reinforce the attached infantry company for HRP missions.

FIGURE J-3 (C). Average Available Combat Power For Tank Battalions (U).

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(2) The 1st Battalion, 69th Armor, 4th Infantry Division had the more conventional organization for combat. One tank company was normally detached, while one infantry company, usually mechanized, was attached. In addition, the battalion generally received an engineer platoon, a platoon of M42 twin 40mm "Dusters," engineer mine sweep teams, sniper teams, and long-range reconnaissance patrol (LRRP) teams. When the level of enemy activity warranted, additional infantry was provided. Frequently, a tank platoon and/or headquarters tank section was detached for limited independent missions.

(3) The 1st Battalion, 77th Armor, 1st Brigade, 5th Infantry Division (Mechanized) had a constantly fluctuating organization for combat which was dependent upon the assigned AO and mission. The brigade normally rotated its maneuver battalions through a series of set AOs, tailoring the task force assets with each rotation. The battalion had controlled as many as five company-size maneuver elements, while at other times it had as few as two, neither being organic. Whenever the battalion operated in heavily mined areas, engineer mine sweep teams were attached. Frequently, the battalion conducted small combined operations with ARVN or local regional force companies. The only constant factor in the organization for combat of this battalion was the fact that the battalion never controlled all its organic tank companies. In addition to its organic tank companies, the battalion had as a permanent attachment, Troop A, 4th Squadron, 12th Cavalry, which the commander considered his most valuable combat element.

(4) The 2d Battalion, 34th Armor, 25th Infantry Division operated under a severe handicap; two of its tank companies were permanently detached. One company was assigned to the 1st Infantry Division, while the second moved from major command to major command. At the time of the evaluation, it was assigned to the 1st Brigade, 5th Infantry Division (Mechanized), where it had become a "tank troop" of the 3d Squadron, 5th Cavalry. Consequently, the battalion rarely was required to detach any of its remaining combat power. It normally received one mechanized rifle platoon, and habitually worked with at least one RF company.

(5) In addition to the organic and attached units indicated in Figure J-3, the tank battalions received support from outside sources. During the evaluation each battalion averaged approximately seven artillery missions, one armed helicopter sortie, and three close air support missions daily. In addition, one battalion received an average of one naval gunfire support mission each day. All commanders stated this support was adequate, although in some cases it was not responsive.

### c. Tactics

#### (1) General

As with other armored elements in RVN, tactics employed by the tank battalion were characterized by concentrated efforts to search

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out the enemy; find his base camps, caches, and harboring areas; interdict his movement; and destroy him. All commanders emphasized the difficulty in finding the enemy and the fact that once-lucrative AOs rapidly "dried up" after an armor unit arrived in the area. The enemy's fear of armored fire power generally caused him to disperse his units or move elsewhere. The psychological effect on the enemy, while increasing the security of the area, compounded the problem of making contact. Tank battalions lacked the organic dismounted capability necessary to ferret out small groups of VC in dense vegetation. As a result, routine operations covering large areas infrequently showed tangible results.

### (2) Reconnaissance Operations

(a) The majority of operations conducted by two tank battalions were essentially reconnaissance missions. One battalion was involved primarily in security operations during the period of the evaluation. Disregarding local variations in terminology, the purpose of the typical operation was to find and destroy the enemy, and to deny him fixed operating bases or access to populated areas.

(b) This type of operation was conducted either along a well-defined axis or within specified boundaries. Contrary to doctrine, in dense jungle the tanks were used to knock down the heavy trees in order to open new routes, which reduced the danger from random mining to the more vulnerable M113A1's. In open country or light scrub, the lighter APC/ACAVs, if available, led unless there was a known mine threat. Reconnaissance by fire was employed against suspected enemy positions. Whenever there was indication of enemy activity, a detailed dismounted search was conducted. Attached infantry, if available, were used to conduct this search. If not, elements of the battalion scout platoon or, on occasion, a portion of each tank crew dismounted. During the dismounted search, tanks would provide fire support and/or would accompany the dismounted elements.

(c) Normally, upon hearing the sound of approaching armored vehicles, the enemy would either go into hiding or move to avoid contact. Dismounted elements were dropped off a considerable distance from the area to be searched, and the armor formation proceeded to the flanks of the objective area or to some other point to deceive the enemy. In either case, they were prepared to support the dismounted elements by fire, or to maneuver to block enemy escape routes. In the tank battalion AOs, reconnaissance operations were normally conducted by separate platoons because of the low level of enemy activity; this also maximized area coverage.

### (3) Security Operations

(a) There were several different types of security operations conducted; however, all of them stemmed from the requirement to secure

J-6

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either fixed installations or ground lines of communication (LOC). Whenever possible, units accomplished security objectives by conducting offensive reconnaissance.

(b) When the required degree of security could not be obtained by reconnaissance operations, LOC security was provided by outposting and employment of strong points. This technique consisted of placing single armored vehicles in positions where they could provide mutual support overlooking the route and surrounding terrain. When any portion of the route was threatened, the nearest outposts would immediately react to reinforce the area endangered. In routes through rugged terrain in which many water obstacles existed, bridges were extremely vulnerable to enemy interdiction. These were secured by strong points, whose size and composition varied. One unit used its mortar platoon in the dual role of providing strong point security at a bridge and general fire support for the area.

(c) In all cases, a ready reaction force was maintained. Every commander stressed that, as long as the armor unit maintained the ability to mass rapidly, the enemy was normally unwilling to risk annihilation by massed firepower.

### (4) Road and Mine Clearing Techniques

(a) Differing from the cavalry regiment, tank battalions frequently had the requirement to open roads without the responsibility of escorting or securing the convoy during transit. The techniques used by the tank units to secure the dismounted mine sweep elements were essentially the same as those employed by the regimental cavalry squadrons.

(b) All tank unit commanders stressed the fact that, after an armored unit had operated for an extended period in a fairly fixed AO, the mine threat increased. During the rainy season, the enemy rapidly determined where the tanks could travel and placed their mines accordingly. This tactic significantly increased the requirement for mine sweeps and mine clearing operations. Passive defensive measures, such as never following old tank tracks and reliance on the column formation, were emphasized.

### (5) Night Operations

(a) In conjunction with daylight reconnaissance and security operations, heavy command emphasis was placed on night operations. The primary night operation consisted of the establishment of numerous small mounted and dismounted ambushes, together with the establishment of company and platoon NDPs.

CONFIDENTIAL

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(b) A tank company would frequently split into as many as four or five mounted ambush sites, sometimes called hardspots. All ambushes relied heavily on either infrared or passive night vision devices for area surveillance. The two systems were used to complement each other in only one unit. In all units, tank searchlights were used to illuminate suspected enemy movement routes and point targets. Whenever dismounted infantry or scouts were available to reinforce the mounted ambush sites, ambush effectiveness was enhanced. Most mounted night ambushes were composed of at least three armored vehicles positioned triangularly.

(c) Several very effective techniques were developed using mounted and dismounted ambushes in a coordinated plan to interdict enemy movement through an area. One technique was to position the mounted element where it could be easily seen by the enemy, who then maneuvered to avoid it only to encounter a dismounted ambush on the logical detour route.

(d) In areas where small ambushes posed too much of a security risk, units established a series of platoon-size or larger NDPs. These were generally elaborately prepared and included concertina wire, trip flares, claymores, and RPG screens; also, they were often supplemented by electronic intrusion detectors set out along the most likely avenues of approach. To maintain silence, heavy reliance was placed on portable radios to avoid periodically having to run the vehicle engines to generate power for vehicle-mounted radios.

(e) Every battalion had the capability to move all or some of its elements at night and did not hesitate to do so when required. The percentage of nights tank battalion elements moved, and the reasons for movement, are shown in Figure J-4. Every commander emphasized that night movement by armor units was not covert. This resulted in reliance on natural moonlight, vehicle headlights, offset flare illumination, and occasionally the xenon searchlight.

UNIT	NIGHTS MOVED	MOVEMENT OBJECTIVES			
		COMPLETE DAY MOVE	RESPONSE TO INTEL	RFF	OTHER
1/69	30%	50%	35%	10%	5%
1/77	15%	60%	20%	10%	10%
2/34	14%	60%	15%	10%	15%

FIGURE J-4 (C). Night Movement Conducted by Armored Battalion Elements During Evaluation (U).

J-3

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(f) During the evaluation, more tactical success resulted from night operations than from daylight operations. All commanders stressed the requirement for dismounted personnel to be employed in conjunction with the mounted elements to achieve this success.

### (6) Combined Operations

Increased emphasis had been placed on small-unit combined operations. Most frequently, an RF company or platoon would work with a like-sized tank element on reconnaissance operations, with the RF providing the dismounted force. In all cases, commanders agreed that the RF became more aggressive when supported by tanks. Similarly, population and resource control operations were conducted with local elements from the GVN District Headquarters or the National Police. Despite occasional problems resulting from language barriers, all commanders agreed that this type of operation was especially effective in populated areas, because these local elements were available to conduct the searches, interrogations, and identification checks.

#### d. Enemy Contact

The level of enemy activity throughout the evaluation was low. The tank battalions averaged enemy contact on one of every three days during the 40-day data collection period. The majority of these contacts involved one battalion during a 10-day period of enemy harassing attacks on its division MSR. Discounting that period, the battalions averaged enemy contact one out of every five days resulting in an average of 5.4 enemy KIA per contact. Thirty-three percent of the contacts were with enemy platoon-sized forces, while the remaining 67 percent were with squad-size or smaller elements. This excludes indirect fire attacks. Twenty-six RPGs were fired at tanks during nine separate contacts, none hitting their target or causing any damage or casualties. As with the regimental cavalry squadrons, anti-tank mines posed the greatest threat. Of 36 mines encountered, 22 were safely detected, the majority by visual means. Ten mines hit were hit off the road in or near old tank trails or randomly implanted in the brush. Four mines were hit on roads.

### 2. (C) ORGANIZATION

#### a. General

##### (1) Introduction

The organizational problems encountered in the tank battalions are documented in this paragraph. Included herein are only those issues on which there was substantial agreement among commanders and others interviewed. There is a necessary correlation between organization and equipment. Where an organizational problem has an implied equipment impact, the latter is concurrently discussed. On the other hand, quantitative

J-9

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equipment problems are discussed in paragraph 3, and the qualitative aspects of the equipment are discussed in Ann

### (2) Organization Mix

(a) None of the commanders interviewed were completely satisfied with the current mix of elements in the tank battalion shown in Figure 3-5. Despite the apparent dissatisfaction, there were some areas of agreement. For example, no commander indicated a requirement for a mechanized flame section.

(b) All commanders felt that the battalion headquarters could easily control additional maneuver companies, two of them having had successful experience in controlling five. All commanders stated that a fourth organic maneuver company would be highly desirable. However, there was disagreement on what it should be. Two wanted either a mechanized infantry company or a cavalry troop, while the third desired an additional tank company to provide assets for more extensive cross-attachment with the infantry. This was in addition to the universally stated requirement for an organic security element in each tank company. One commander was very emphatic in his statement that, at the current level of conflict, a pure tank battalion, with little organic dismount capability, could not function effectively.

### (3) The Army Authorization Document System (TAADS)

All commanders were queried as to their opinion on the adaptability of TAADS in stability operations. None of the battalion commanders were thoroughly familiar with the system. However, based on their RVN experiences with TOEs and MTOEs, they felt the system was cumbersome, unrealistic, and impractical. The commanders stated that periodic revisions to the basic authorization documents had created a chaotic situation in which most units were uncertain as to their actual authorization for many items of mission-essential equipment and key personnel (see paragraph III-6e).

#### b. Battalion Headquarters

##### (1) Command and Control

###### (a) Helicopters

The tank battalions had no organic helicopter assets. Commanders averaged approximately 2 1/2 hours allocation of "blade time" daily for command, control, and reconnaissance. However, in one tank battalion, this allocation included total time available for all types of missions, including logistical requirements. In the other two battalions, utility and/or cargo helicopter sorties provided for logistical missions when resupply by ground was not possible. If an element of the battalion made contact, a helicopter was generally made available for command and control. However, due to the short duration of most contacts, the action

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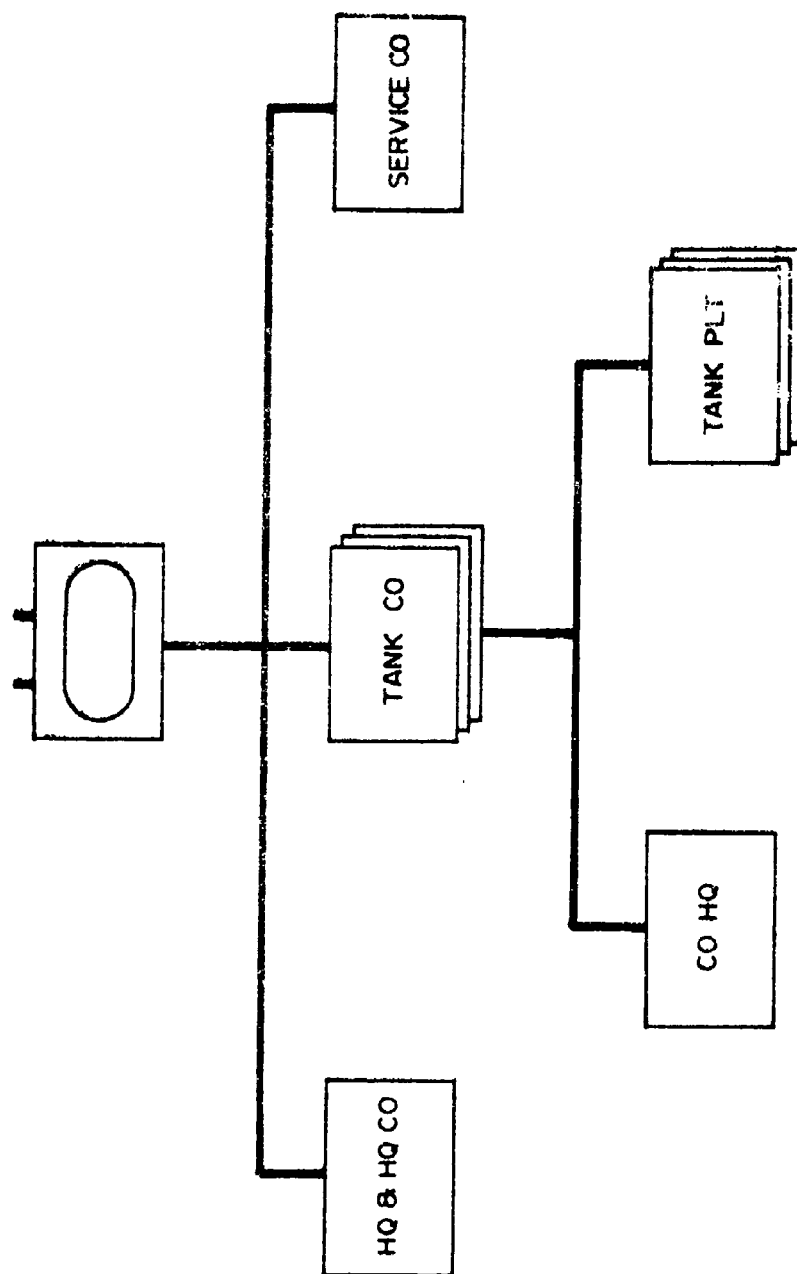


FIGURE J-5 (U). Organization of the Tank Battalion.

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was often completed before the commander could arrive. All commanders considered the lack of adequate or responsive helicopter support their most significant command and control problem.

## (b) Command Vehicles

Only one battalion commander had ever utilized his command tank to control maneuver elements. The primary reason stated was that a commander employing the tank would isolate himself with one element and significantly decrease his ability to influence the action if another element of the battalion made contact. Only one commander used his authorized 1/4-ton vehicle for command functions -- a special situation in which the unit's AO paralleled a paved highway.

## (c) Communications Equipment

Two of the three commanders stated that additional command communications were required. With the heavy reliance on secure voice communications, in addition to the traditional clear FM command nets, authorized equipment was thought inadequate. This problem is discussed in paragraph 3k(2), below.

## (2) Fire Support Coordination

Artillery liaison teams attached to battalions had to operate an FSOC responsible for coordinating all fires in the unit AO. This was in addition to normal artillery requirements. In two battalions, the authorized communications equipment of the attached liaison team was not considered adequate. In both cases the liaison team was provided from a GS artillery unit and was equipped with a single radio without a secure capability. In these units commanders considered it necessary to augment the artillery liaison team with the S3 Air's M577A1, equipped with necessary radios taken from unused administrative vehicles. Only in the battalion organic to a mechanized brigade did the liaison team provide its own M577A1 and sufficient communications equipment for coordination of organic and nonorganic supporting fires.

## (3) Unit Location

Controlling dispersed subordinate elements and maintaining unit locations in dense vegetation constituted a continuing command and control problem. This problem and various techniques developed to overcome it are discussed in detail in paragraph 2c(3), Annex G.

## (4) Staff Functioning

(a) Only one battalion was able to consolidate both its operational staff and logistical elements in a centralized location. However, even in this unit, the S1, PBC, and rear detachment were located at their brigade base camp.

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(b) Two battalions operated a forward TOC in a PSB, a rear CP in the brigade base camp, and occasionally were required to operate from a third location. In addition, 24-hour operations were required at each location. The forward TOC, under the supervision of the battalion commander, generally consisted of the S2, S3, S3 Air, Artillery Liaison Officer, and S5, with about half of the headquarters staff NCOs and radio operators. The rear CP, under the supervision of the battalion executive officer, normally consisted of the S1, S4, liaison officers, and the balance of the S2/3 section, augmented by the air control team. The third CP, when required, was manned by a liaison officer and radio operators taken from the battalion headquarters section drivers or communications platoon. These multiple CP requirements overextended the authorized staff personnel.

(c) The S5 assumed an increasingly important role in operations in RVN. With the Vietnamization of the war and emphasis on civic action and combined operations, S5 activities were used to complement many battalion operations. To accomplish this, tank battalion commanders reiterated the S5 functions and desired organization as discussed in paragraph 2c(4), Annex G.

### (5) Dispersion and Rear Area Requirements

(a) Each of the three battalions operated under a different set of factors dictated by the missions assigned and their respective locations. The resultant unit dispersion of both personnel and equipment increased multiple security requirements, which had to be met from organic assets. This contributed to certain organizational problems.

(b) The 1/69th Armor was required to keep two operational rear locations: the first, at the division base camp, consisted of the S1 section, the supply section, and 35-50 men; the second, at their brigade base camp, consisted of the battalion XO, S4, VHC(-), Company D, and the service support elements. This totalled approximately one third of the battalion's strength. The forward TOC, collocated with one tank company, was situated at a small PSB. Other organic and attached elements manned up to six other semipermanent security sites spread along 40 kilometers of QL 19.

(c) The 1/77th Armor maintained a permanent base camp collocated with its brigade headquarters at Quang Tri Combat Base. All logistical and administrative functions were consolidated under the battalion XO at that location. Daily coordination visits were conducted with the forward CP approximately 12 kilometers away. The battalion had an additional requirement to maintain a small base camp defense TOC at the Cua Viet Naval Base approximately 20 kilometers in the opposite direction. Approximately 15 percent of the battalion's total strength was required for rear area security at these locations.

(d) The 2/34th Armor was the only unit able to consolidate the majority of its headquarters and service support elements. This employ-

## CONFIDENTIAL

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ment facilitated service support operations and minimized the use of combat elements for rear area security.

### (6) Liaison

(a) Liaison requirements for the tank battalions varied considerably between units and frequently within a unit, depending upon the mission and AO assigned. One commander was satisfied with the MTOE authorized liaison section. Another commander stated that at times his liaison section had been adequate; at other times it had been woefully inadequate. The third commander stated that the authorized section was totally inadequate.

(b) In the unit satisfied with its liaison authorization, its brigade headquarters performed all required liaison with local GVN district and province officials. The other two battalions maintained liaison with two to five different organizations, including ARVN units sharing portions of their AO, local GVN officials, US Special Forces units, RF or PF units, and other US military forces, as well as with their brigade. This function became increasingly important with the Vietnamization of the war and the small size of the units involved in combined operations. The liaison function was considered essential to prevent inadvertent contact between US ambush patrols and other friendly elements.

### c. Combat Support and Combat Service Support Elements

#### (1) General

##### (a) MTOE Organization

Under the MTOE, combat support elements were located in HHC and service support elements were located in Company D, Figure J-6 and Figure J-7, respectively. This organization differs from the G-Series TOE, in which all of these elements are located in HHC. The MTOE organization was based on a recommendation made by the MACOV study in which it was stated that:

".... due to the large amount of service support required by a tank battalion, a separation of the two functional areas; command and control, and combat service support, would materially benefit the battalion ... service support (would be) maximized by placing combat service support elements under one commander who can devote full time to this task." (MACOV, Vol V, 4a)

##### (b) Organizational Problems

In each tank battalion, the commander, the executive officer, and the HHC and Company D commanders were interviewed concerning the effectiveness of the MTOE organization of combat support and combat service support elements. All those interviewed stated that the organization was unsatisfactory and created a duplication of command responsibility assigned to the HHC and Company D commanders. Only in one battalion did the Company D

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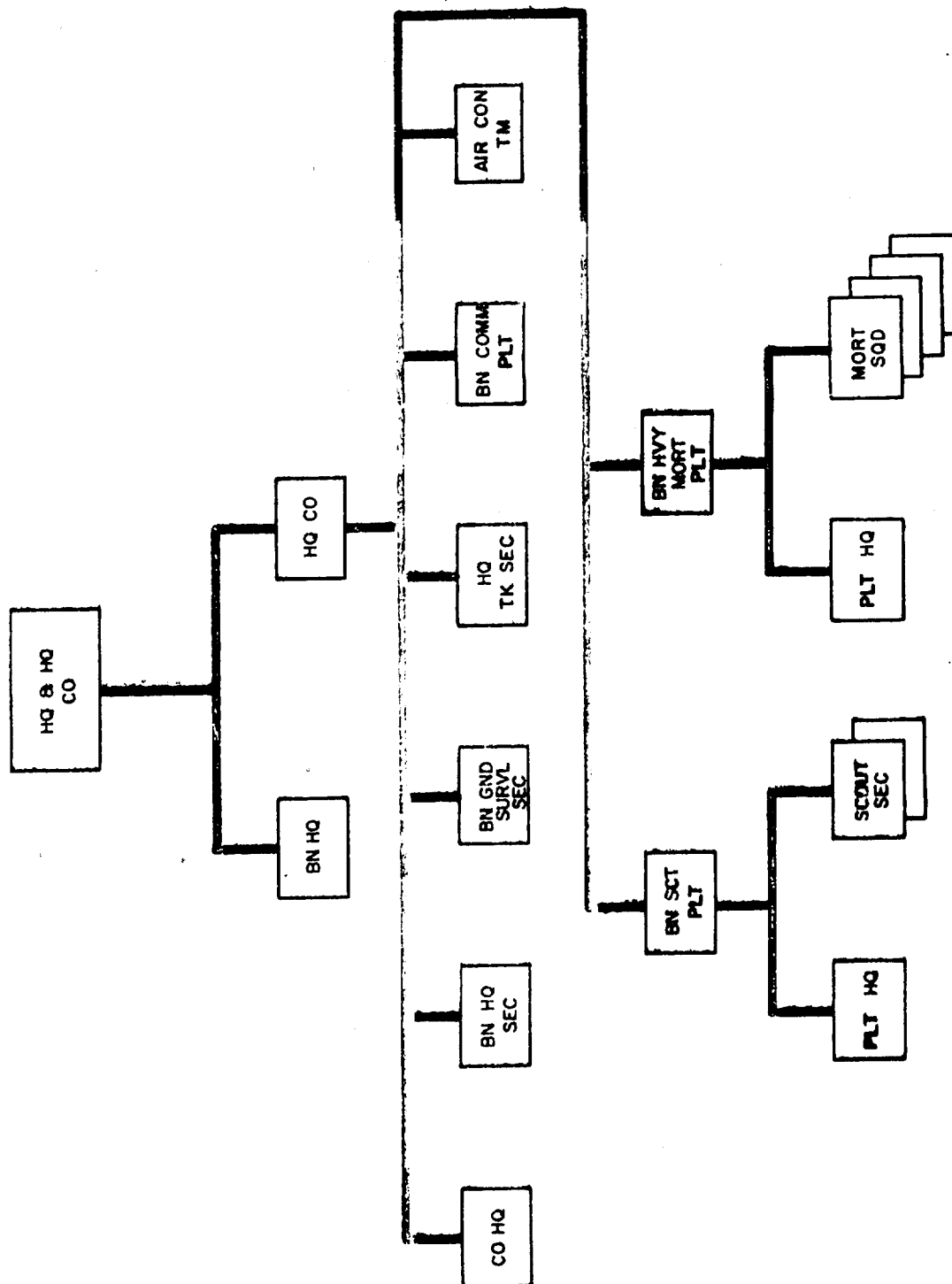


FIGURE J-6 (U). MTOE Organization of RHC, Tank Battalion.

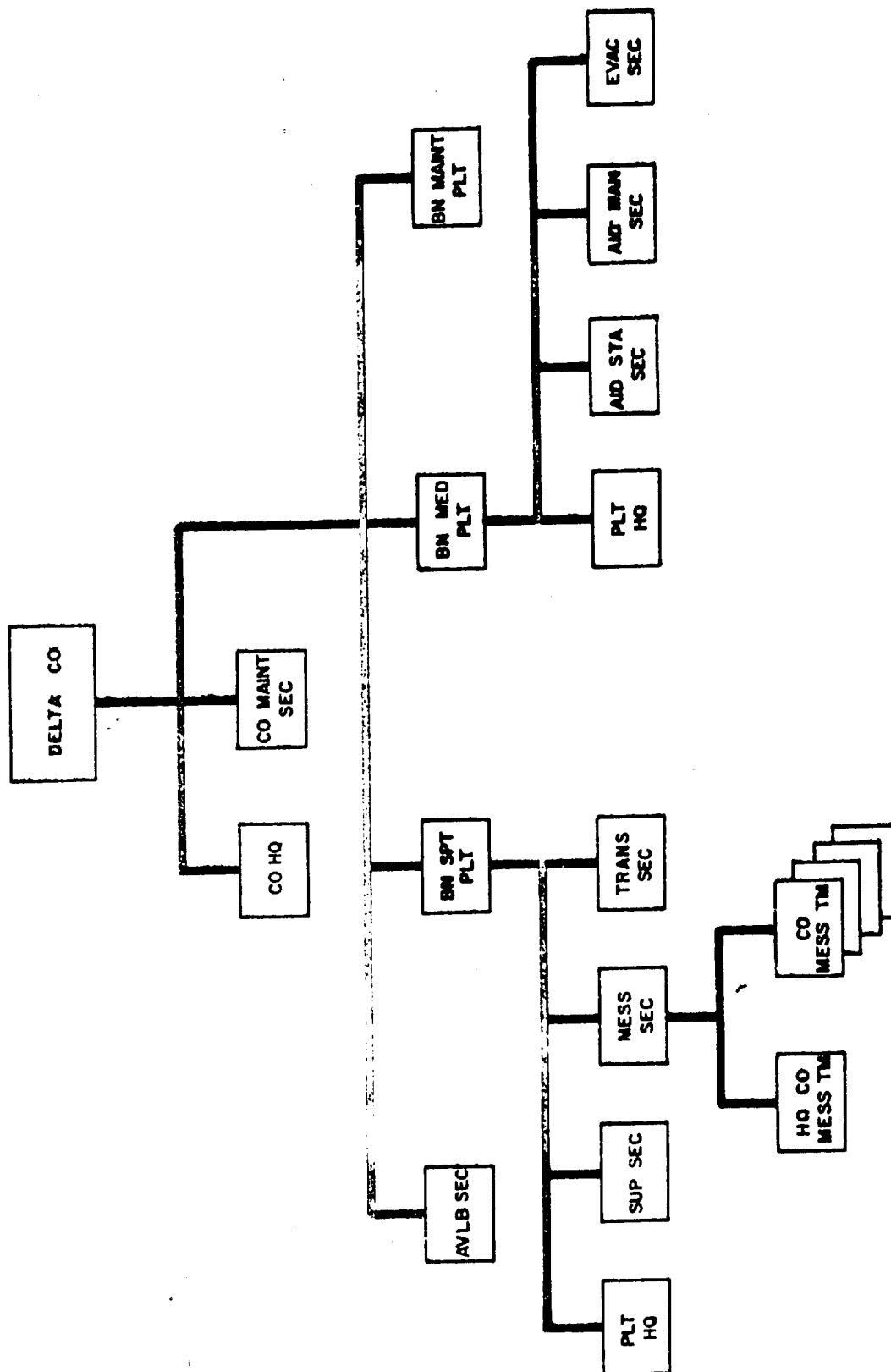


FIGURE J-7 (U). MTOE Organization of Service Company, Tank Battalion.

## CONFIDENTIAL

commander have any duties concerning the actual operations of the combat service support elements, and this was only on an occasional basis. In each case, supervision of these elements was done by the unit staff. It was unanimously recommended that HHC be reorganized to contain the battalion headquarters, communications platoon, medical platoon, support platoon, maintenance platoon, bridge section, and air control team. The justification was that the HHC commander could then act solely as the headquarters commandant, since all the elements normally associated with the unit and special staffs would be assigned to HHC instead of two separate companies. Also, it would remove his responsibility for the battalion's combat support elements. Further, it was recommended that Company D be reorganized as a combat support company with the scout platoon, heavy mortar platoon, ground surveillance section, headquarters tank section, a maintenance section, and a control headquarters. It was thought this organization would provide the flexibility of an additional company-sized combat control element when required. This reorganization would also clearly delineate the responsibilities of both the HHC and the Company D commanders.

### (2) Headquarters and Headquarters Company

#### (a) Command and Control

1. The roles and duties of the HHC commanders in the three armored battalions varied considerably as a result of local task organization and headquarters dispersion. In two battalions, the HHC commanders performed primarily as headquarters commandants, concentrating on management of base camp/FSB activities. In this role, the commander was responsible for the administration of HHC, supervision of base camp/FSB details, and security. Neither of these companies had the authorized executive officer, and neither commander felt one was needed under the current conditions. These commanders stated that their command and control could have been conducted more efficiently if they had been provided with a tracked command post vehicle, preferably an M577A1, with two radio receiver-transmitters. This item was felt to be essential if the command post were to be operated from a field or temporary FSB location. The authorized command vehicle was a 3/4-ton truck. This vehicle lacked needed mobility and space.

2. In the third battalion, the HHC commander was concerned primarily with the tactical control of the reinforced combat support elements of HHC which were organized as a maneuver element (see paragraph 4e, Annex B). He retained the responsibilities of headquarters commandant; however, these duties were actually performed by the company executive officer. This commander used the battalion air control team M113A1 with two radio receiver-transmitters as a CP and fighting vehicle.

#### (b) Combat Support Elements

The battalion combat support elements assumed an increasingly important combat and security role in RVN. With the combat elements

CONFIDENTIAL



# CONFIDENTIAL

widely dispersed and fully committed to reconnaissance and security operations, commanders retained little tactical flexibility. The combat support elements became an important tool with which to influence the action. Under the MTOE, all the combat support elements except the AVLB section were assigned to HHC.

## 1. Battalion Scout Platoon

a. All commanders considered the scout platoon primarily as a light offensive combat element rather than a reconnaissance unit. It provided the sole organic source of readily dismountable personnel to perform detailed searches, day and night ambushes, and special operations. Two commanders estimated their scouts operated up to 50 percent of the time dismounted, generally operating in support of another element of the battalion.

b. In the first battalion, the platoon normally remained intact. It performed convoy escort, small mounted/dismounted sweeps, saturation ambushes, small security tasks, and occasionally operated in conjunction with the headquarters tank section as a small economy-of-force cavalry-type unit. In another battalion, the platoon was habitually split



FIGURE J-8 (U). Scout Platoon M113A1 APC/ACAVs on Sweep Operation.

J-18

# CONFIDENTIAL

## CONFIDENTIAL

into sections and employed as two separate maneuver elements for the same types of missions as in the first. In the third battalion, the scout platoon worked as an integral element of HHC, which was organized as a maneuver company (see paragraph 4e, Annex B).

c. To provide the platoon with more staying power to perform the missions assigned to the scout platoon, commanders expressed a requirement for limited additions to the authorized platoon armament [see paragraph 3j(4), below].

d. The commanders considered authorizations for command and portable radios in the scout platoon inadequate, as discussed in paragraph 3k(2), below.

### 2. Battalion Mortar Platoon

a. All commanders were satisfied with the firepower and illumination provided by the battalion mortar platoon's four 4.2-inch mortars. Mortar fire support was integrated into the artillery fire plan. Under this system, the mortars came under nominal control of the artillery liaison officer except for selection of firing positions. Two battalions always employed the platoon intact, splitting into sections only to provide continuous fire support during displacement. The third battalion was unable to consolidate its mortars due to base security commitments. In this battalion, the platoon operated as two sections 75 percent of the time and as separate squads 25 percent of the time.

b. None of the commanders expressed a desire to exchange the 4.2-inch mortar for the 81mm mortar. However, each stated that a mix of three mortar sections, two sections of 4.2-inch mortars and one two-tube section of 81mm mortars, would greatly enhance the battalion's capability to provide close-in protective fires and more responsive self-illumination. Additionally, they also considered the 81mm mortar section advantageous, because frequently no clearances were required for 81mm fires.

c. No unit had fire direction problems other than those attributable to personnel shortages. The supporting artillery FO teams attached to each line company controlled mortar fires. In two battalions, the three two-man mortar platoon FO teams were used to augment mortar crews and the fire direction center. In the third battalion, the FO teams retained their identity, but generally were used as described above, only occasionally functioning in their assigned role. All mortar platoon leaders and platoon sergeants interviewed emphasized that the FDC required additional communications capability, as discussed in paragraph 3(2), below.

d. With the wide dispersion of combat elements, the mortar platoon was frequently required to assist in providing local security for FSBs or NDP perimeters.

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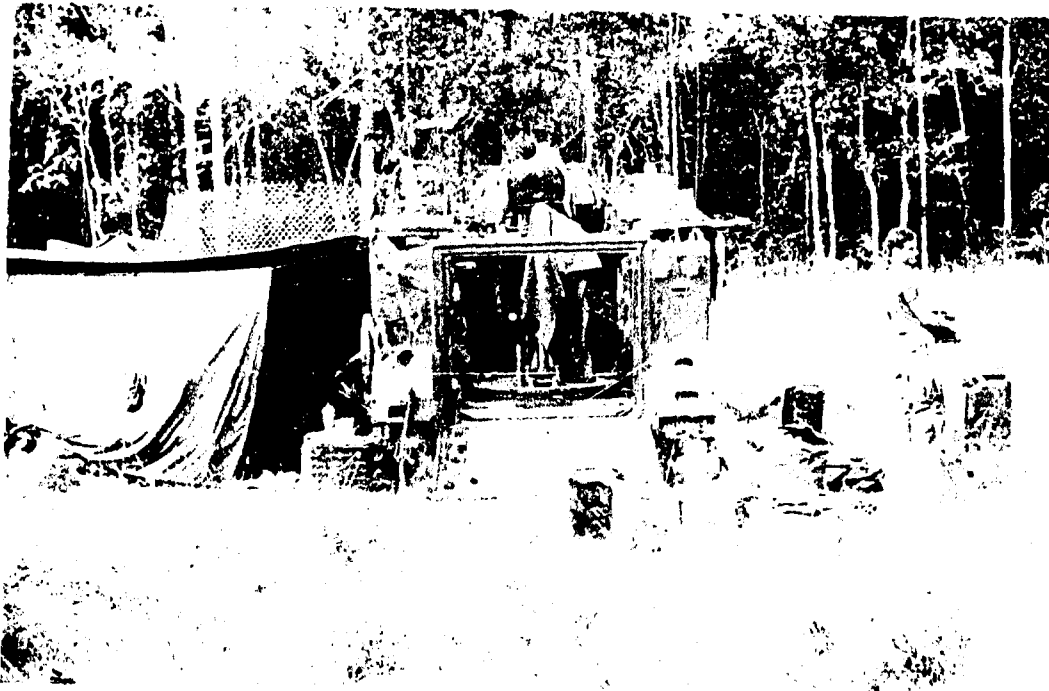


FIGURE J-9 (U). 4.2-Inch Mortar Firing Position on NDP Perimeter.

3. Headquarters Tank Section

In none of the three battalions was the headquarters tank section used as doctrinally intended. Rather, it was employed as an additional light combat element. In two battalions, the section was frequently used to reinforce a tank company. Other uses were either separate employment for RRF or in combination with the scout platoon or a mechanized infantry platoon for independent economy-of-force missions. All commanders felt it essential to retain this section for its evolved roles, as it provided them needed flexibility. There were no organizational problems associated with the headquarters tank section.

4. Battalion Ground Surveillance Section

a. The MTOE reduced the ground surveillance section to two AN/PPS-5 radars, which were carried on M113A1 APC/ACAVs. The radars on hand are shown in Figure J-10. One AN/PPS-4 radar had been issued in lieu of the AN/PPS-5. Two battalions retained control over their radars while, in the third battalion, employment of radars was directed through division G2 channels.

J-20

CONFIDENTIAL

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UNIT	PPS 5		PPS 4	
	AUTH	O/H	AUTH	O/H
2/34	2	1	0	1
1/69	2	1	0	0
1/77	2	2	0	0

FIGURE J-10 (U). Radar Equipment Authorized and On Hand in the Tank Battalions.

b. In one battalion, radars were not used because of maintenance problems and the shortage of trained operators. In this unit, the two ground surveillance M113A1 APC/ACAVs were used to augment the scout platoon. In the second battalion, the radars were used extensively, but with little results. In this unit, they were employed in fixed locations such as FSBs, base camps, or bridge sites 85 percent of the time, and with smaller NDPs or ambush patrols 15 percent of the time. Normal employment of radar in the tank battalions is shown in Figure J-11.

UNIT	NORMAL EMPLOYMENT			HQ CONTROLLING EMPLOYMENT & SUPPORT	
	BASE CAMP	FSB	NDP & AP'S	HIGHER HQ	BATTALION
2/34	PPS-5 50%	PPS-5 50%	PPS-4 100%	X	
1/69	0%	0%	0%		X
1/77	0%	85%	15%		X

FIGURE J-11 (U). Normal Radar Employment in the Tank Battalions.

c. Two tank battalion commanders stated the MTOE authorization for radars was sufficient, while one expressed a desire to increase the authorization to six. However, none of the commanders had been impressed by results achieved, even with trained operators.

# CONFIDENTIAL

## 5. Air Control Team

The air control team as authorized by MTOE was not used in its intended role in any unit. Personnel were absorbed in the S2/S3 sections.

### (3) Service Company (Company D)

#### (a) Command and Control

In each of the three battalions, the duties of the Company D commander concerned administration of the company, base camp, mess, and security functions. All persons interviewed felt that many of the Company D commander's duties paralleled those of the headquarters commandant.

#### (b) Company Maintenance Section

The organization of this section was considered adequate. Equipment requirements are discussed in paragraph 3d(5), below.

#### (c) Support Platoon

##### 1. Organization

Personnel interviewed felt the support platoon organization was adequate to support operations except for insufficient supervisory personnel and radios in the transportation section. This section was authorized more vehicles (20) than any other section in the battalion. All commanders agreed that an E7 NCO was required as an assistant section leader and that two E6 NCOs were needed to supervise the operation and maintenance of tracked and wheeled supply vehicles. Additionally, it was felt that these supervisory personnel were needed to control logistical operations conducted from multiple locations. Control was further hampered by the lack of authorized radios. Each section had several unauthorized portable radios which were used in helipad operations and on the section's vehicles. Personnel interviewed felt that at least four portable radios were required.

##### 2. Resupply Operations

###### a. General

Each tank battalion drew bulk supplies (Classes I, II, III, IV, and V) from supporting elements in the brigade base camps. From that location, supplies were delivered primarily by ground means to the FSBs and maneuver elements. One battalion, whose AO was accessible by road, relied extensively on wheeled transport of supplies. The other battalions transported supplies to the FSB by wheeled vehicle, and from

J-27

# CONFIDENTIAL

## CONFIDENTIAL

there forward by tracked vehicles. Approximately 10 percent of each battalion's resupply was conducted by air during the evaluation. At other times, it had been as high as 70 percent. When this occurred, there was a problem providing personnel to operate helipads. Drivers had been taken from their vehicles to perform this function.

### b. Class III

Because of the nature of operations and the limited amount of POL handling equipment, the resupply of Class III was a problem. In one battalion, a single M49C 1200-gallon fuel truck made continuous trips along the road the unit was securing, refueling each vehicle every other day. This was not felt to be a satisfactory arrangement. The unit had requested an additional M49C to be issued on temporary loan. The other two battalions relied primarily on the tanks returning to the FSBs, where bulk fuel was available. If the mission required, an M548 with a Class III container would accompany, or be sent to, the maneuver elements. Air resupply resulted in problems in dispensing fuel from containers as discussed in paragraph 2d(3), Annex G.



FIGURE J-12 (U). FSB Refueling Point.

J-23

CONFIDENTIAL

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## c. Class V

Only one battalion maintained on hand a sizable quantity of ammunition which was not included in the basic load carried on vehicles. This unit had an ASP at its FSB at which ammunition was stocked. Companies replenished expended ammunition when they returned to the FSB every other day. This unit also stored ammunition on one wheeled and one tracked vehicle in order to conduct responsive overland emergency resupply. One battalion drew Class V from an ASP and delivered it by road on request to its companies. The third battalion was able to conveniently resupply directly from its base camp. Each battalion maintained an emergency air supply capability.

## d. Water Resupply

Water resupply was a problem in all tank battalions, as discussed in paragraph 3f(4), below.

## (d) Maintenance Platoon

### 1. Organization

In general, personnel interviewed felt that the maintenance platoon's organization was adequate to support battalion operations. They were satisfied with personnel authorizations; but, as in the ACR, all felt replacement mechanics were not adequately trained.

### 2. Maintenance Operations

#### a. Dispersion

Each battalion had consolidated its maintenance platoon during the evaluation. In one case, it was located at a FSB; in the others, at the base camp.

#### b. Recovery

Only rarely did the maintenance platoon use its recovery capability as such (paragraph 3d(2), below).

#### c. Periodic Services

The performance of quarterly services on tracked vehicles was affected by operational requirements. In many cases, scheduled services were not performed, and when they were, vehicles were made available only for brief periods. Many commanders stated their missions precluded these services. Maintenance personnel stated that failure to perform these services resulted in increased downtime for combat vehicles.

CONFIDENTIAL

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## d. Prescribed Load List (PLL)

In two battalions PLLs were consolidated at battalion level. Additional personnel were assigned to the maintenance platoon to manage the PLL. In the third battalion, the PLL remained at company level.

## e. Shop Facilities

All personnel interviewed felt that certain equipment was needed to increase the efficiency of maintenance operations. Among these were the M109 shop van and a steam jenny, as discussed in paragraph 3n(2), below.

## (e) Medical Platoon

### 1. Organization

There were only minor variations from MTOF organization in the medical platoons of the tank battalions. One battalion had a surgeon only on a part-time basis. The commander of this battalion stated that he required a full-time surgeon for medical and civic action duties.

### 2. Medical Operations

#### a. Company Aidmen

Most surgeons, medical service officers, and medical platoon sergeants stated that the three company aidmen should possess MOS 91C instead of MOS 91B. This higher skill level in each company would be valuable not only for treating casualties, but would decrease the loss of man hours caused by sending personnel to the surgeon for minor injuries and illness. It would also enhance civic action programs.

#### b. Medical Evacuation

While almost all medical evacuations were by air, personnel felt a valid requirement existed to maintain the platoon's ground evacuation capability to support dispersed tactical operations. It was also felt that the vehicles in this section needed the M113A1 Armament Subsystem "A" to enhance self protection.

#### c. Aid Station

Two battalions maintained an aid station at an FSB and each battalion maintained an aid station in the base camp. When two aid stations were established, personnel and equipment came from authorized assets. This created no apparent problems.

J-25

# CONFIDENTIAL



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## (f) AVLB Section

Each tank battalion was satisfied with the current AVLB section. Each battalion had two bridges on hand. During the evaluation the bridges were used infrequently.

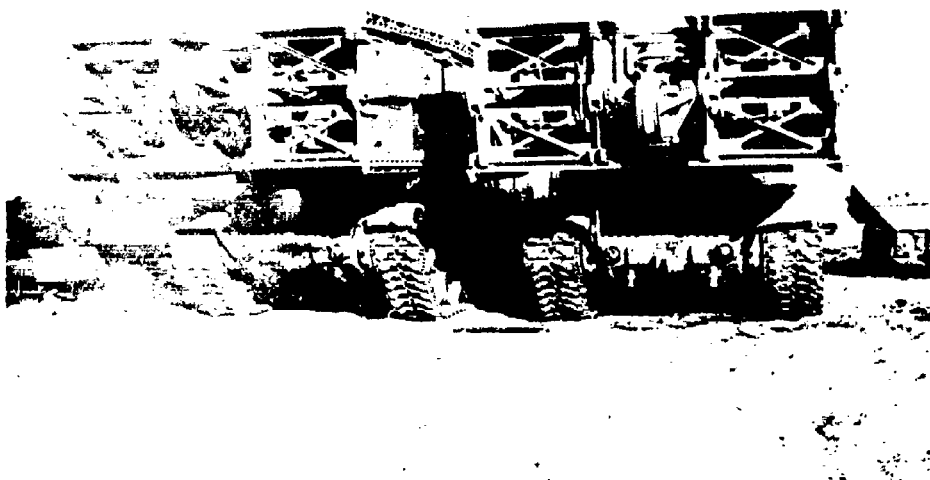


FIGURE J-13 (U). AVLB Section of the Tank Battalion.

## (g) Communications Platoon

### 1. Organization

In general, personnel interviewed stated that the communications platoon was authorized sufficient personnel to support battalion operations. However, personnel and equipment authorized the platoon were frequently used in a manner differing from that intended in the MTOF.

### 2. Operations

The communications platoon in the tank battalions performed three separate services. First, it provided and/or obtained responsive communications maintenance for the battalion; second, it operated the battalion RTT in either the brigade or division RTT net; and third, it operated the battalion message center and switchboard.

J-26

# CONFIDENTIAL

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## a. Communications Maintenance

The time required for communications maintenance varied. In two battalions, organizational level maintenance downtime per item of equipment averaged less than one day, while in the third it was seven days. DS maintenance downtime was proportionate. In the first two units, downtime averaged 1 to 2 days, while in the third unit it averaged over 30 days. All units conducted higher levels of repair, with authorized personnel using unauthorized test equipment and repair parts. Two battalion commanders and all communications personnel interviewed felt that this was operationally necessary and wanted additional test equipment to facilitate maintenance.

## b. Wire Communications

Wire communications were little used, as discussed in paragraph 3c(1), Annex B.

## c. Motor Messengers

The motor messengers and the two authorized 1/4-ton messenger vehicles were rarely used as intended. Instead, the personnel were used to provide additional radio operators for multiple CP locations. When possible, communications personnel trained at least one messenger to perform radio repairs. It was felt that a trade of one or two message clerks/motor messengers for radio mechanics would enhance the platoon's maintenance capability.

## 3. Personnel

The authorized grades of the battalion and company communications chiefs were considered inadequate by commanders and communications officers in all three battalions. This problem parallels that discussed in paragraph 2d(3), Annex G.

### d. Tank Company

#### (1) Organization and Operations

The basic organization of the tank company was not substantially changed by the MTOE. The tank platoon was used as the basic maneuver element of the tank company. Normally it was not split into sections unless detached and working with an infantry unit. In all battalions, the platoon was augmented on a semipermanent basis with a Kit Carson Scout (KCS), a platoon aidman, and a member of the artillery FO team who rode on the platoon leader's tank. When the platoon was detached, a mechanic was generally provided from the company maintenance section. All tank companies maintained small detachments at their battalion rear location consisting of 4-6 percent of their personnel. In one battalion,

J-27

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each company was tasked an additional 5 percent of its strength to provide its share of the battalion's rear area security force. The remainder of the personnel were located in the forward area, at either a PSP or in the field.

### (2) Command and Control

(a) All commanders at all levels stated that the authorized radios for command tanks were inadequate for command and control. The commander was unable to operate in two nets simultaneously. This problem is discussed in detail in paragraph 31(2), Annex G.

(b) In all battalions, the need for a CP vehicle for the tank company was stated. With companies frequently operating for extended periods in their own AO or from a company FSB, a CP vehicle became highly desirable to provide a NCS and for command and control. In all units, the maintenance M113A1 was used to fulfill this requirement; however, this solution deprived the maintenance section of its tracked utility vehicle.

(c) The artillery FO team attached to the company consisted of one lieutenant FO, a reconnaissance sergeant, and a radio operator, with one AN/PRC-25 radio. In all units, the FO rode on the commander's tank rather than the second company headquarters tank, to facilitate coordination of fire support.

### (3) Security Squad

All commanders interviewed stressed the need for an organic security squad in the tank company. It was frankly admitted that this augmentation was desired for two reasons: the squad could be used as crew fillers and for security functions. (Contrary to the ACR, which had sufficient personnel flexibility to keep its tank companies over strength, the tank companies of the tank battalion generally operated under strength. In one battalion, operational tanks were occasionally not used for lack of a complete crew; while in the other two battalions, tanks generally operated with three-man crews.) The local security problems associated with tank units in RVN were greatly increased. The need for dismounted personnel to provide clearing patrols, security type ambushes, observation, and listening posts was complicated and increased by the requirement to secure FSBs. Security of company FSBs frequently was provided from the tank crews. One commander stated that a squad would not be sufficient to satisfy the multitude of security requirements characteristic of the RVN environment. He felt that a platoon was essential. Commanders felt that the addition of at least a security squad would somewhat alleviate this problem.

J-28

## CONFIDENTIAL

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## (4) Company Combat Service Support

Company maintenance sections frequently performed DS-level maintenance operations in addition to organizational maintenance. Many vehicles were kept running by controlled substitution. Because companies were often separated from their parent battalion by considerable distances, this practice was considered an operational necessity to minimize maintenance downtime. All companies transported to the field a small number of high-demand repair parts. The loss of the maintenance M113A1, described above, created a transportation and stowage problem for repair parts. Several commanders felt this could be alleviated by exchanging a M548 for the M35 2 1/2-ton truck authorized the maintenance section.

## e. Detached Tank Companies

### (1) General

Separate tank companies, created from tank battalion resources, are discussed separately, as they exhibit unique problems. Throughout 1968 and 1969, Companies B and C of the 2/34 Armor were detached from their battalion. They retained no ties with their parent battalion other than unit designation. Company B was attached to the 1st Infantry Division until that division's redeployment. Company C was attached to a brigade of the 82d Airborne Division, the 1st Cavalry Division (AMBL), the 101st Airborne Division (AMBL) and in September 1969, to the 1st Brigade, 5th Infantry Division (Mechanized). This latter unit eliminated the problems inherent to the company's "separate" status in that Company C became, for all practical purposes, a "tank troop" of the 3d Squadron, 5th Cavalry and received its proportionate share of support from a unit equipped to support armor.

### (2) Command and Control

At times, the detached company worked directly for a division or a brigade headquarters. This aggravated the problems encountered in all tank companies concerning command communications, and increased the requirement for a CP vehicle. Commanders of these companies stressed the requirements for a communications capability in three radio nets and a 24-hour CP operational capability.

### (3) Security Squad

The stated requirement for a security squad was compounded by the continuing requirement for crew replacements in an MOS not found in the division to which attached. All commanders stated that, in addition to providing the company with a security element, the squad would provide readily available, if only temporary, fillers for crew losses and prevent non-use of operational tanks.

J-29

# CONFIDENTIAL

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## (4) Tank Platoon Organization

Platoons of the detached companies were frequently fragmented down to sections and on occasion to individual tanks. It was not uncommon for a platoon to be detached for extended periods and expected to operate with minimum support from its parent company. To facilitate this type of usage, the company attempted to provide the platoon with two mechanics, an aidman, and a few high-demand repair parts.

## (5) Company Combat Service Support

### (a) Company Maintenance Section

1. In addition to performing organizational maintenance services, the company maintenance section performed most DS-level maintenance and dealt directly with whatever DS or GS maintenance organization was available. However, when attached to airmobile or airborne units, additional problems arose; these units were neither equipped nor staffed to provide support for the M48A3 tank. In addition to many unusual situations developing, this necessitated the companies' carrying and maintaining a sizable PLL, which created additional stowage and transportation problems.

2. Every commander of a detached company emphasized the problem of having to rely on one M88 VTR. In addition to its use in recovery, it was commonly the only heavy-lift capability available. This latter capability effectively eliminated the VTR for recovery, since requirements for lifting rear decks, power packs, and other major components for maintenance took precedence. When the VTR was required by one of the detached platoons, it sometimes took 2-3 days to rendezvous, because of time, distance and security factors. All commanders felt that a detached or separate tank company required a second recovery vehicle to eliminate total reliance on a single piece of equipment.

### (b) Company Resupply

1. Resupply of Class III and V supplies was a constant problem, particularly in airborne and airmobile divisions. The tank companies, as the only users of 90mm tank ammunition and quantity users of caliber .50 machinegun ammunition, were generally required to maintain their own ammunition dump without personnel or equipment augmentation. Bulk POL also created problems in stowage, transportation, and delivery to isolated locations that the companies were not adequately equipped to handle.

2. All commanders felt that two tracked supply vehicles were required for multiple uses. They considered them essential for stowage of repair parts and transport of Class V and bulk POL. As in all other armored units, field refueling operations were complicated by the lack of fuel transfer pumps.

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## (c) Company Administration

Companies in detached status usually operated under a division or brigade headquarters. They were required to accomplish many administrative functions normally performed by their parent battalion S1 and S4 sections including maintaining their own property books, submission of maintenance and personnel feeder reports, and awards and decorations. Each commander felt that this was unrealistic and had utilized two men from line platoons to meet the requirement for clerical personnel.

## 3. (C) QUANTITATIVE EQUIPMENT PROBLEMS

### a. General

The quantitative equipment problems encountered in the tank battalions are documented in this paragraph. Included herein are those subjects on which there was substantial agreement among the commanders and others interviewed. Certain background information is included for subsequent analysis of other issues. Other potential equipment problem areas were considered during the evaluation, but were discarded after analysis indicated no justification. Equipment problems relative to organizational issues, which were discussed in paragraph 2, above, are summarized in this paragraph. The qualitative aspects of equipment are discussed in Annex N. A list of MTOE-authorized equipment considered unnecessary is included at Appendix 3 to Annex C.

### b. M48A3 Tank-Mounted Bulldozer

All battalion commanders expressed a need for a bulldozer capability. They considered the current authorization of one per line company sufficient. However, two stated that the M48A3 tank-mounted bulldozer was unsatisfactory due to its lack of durability and decreased mobility. The third commander, who had just been issued new tank-mounted bulldozers stated that his unit had very little experience on which to judge adequacy. One commander who had experience with the combat engineer vehicle said that this vehicle would satisfy the bulldozer requirement; the other two were doubtful that it would provide any greater capability than the M48A3 with blade.

### c. M577A1 Command Post Vehicles

An additional M577A1 command post vehicle was desired for each tank company and headquarters company as field CP vehicles [paragraphs 2c(2) and 2d(2), above].

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## d. Recovery Vehicles

### (1) General

The tank battalion MTOE authorization for recovery vehicles, five M88 VTRs and two M543 wreckers, was considered insufficient by commanders and maintenance personnel. In each unit, recovery vehicles were used primarily to support motor pool operations, where their lift capability was required to handle vehicle power packs, suspension components, and other heavy items. Commanders considered this utilization so essential that only in one battalion were M88's permitted to accompany combat elements forward of the FSB. In the other battalions, almost all recovery operations were conducted using the M48A3, thus reducing the M88's exposure to mines, chances of becoming mired, and likelihood of VTR maintenance failure. It was felt by maintenance personnel that the use of combat vehicles for recovery operations led to an increase in power-train failures. This was considered a lesser problem than the potential nonavailability of M88's to support maintenance operations. The M543 wreckers were used almost exclusively for motor pool operations.

### (2) Battalion Maintenance Platoon

All personnel interviewed agreed that the authorized recovery vehicles for the maintenance platoon, two M88's and one M543, were adequate to fulfill the mission of the platoon, as well as providing support for Company D and tank companies on maintenance standdown. However, the authorization was not felt sufficient to support HHC.

### (3) HHC

HHC was authorized one M543 wrecker. This unit, which had more tracked vehicles (26) than any other company in the battalion, was not authorized a tracked recovery vehicle. Of its 26 vehicles, 23 were of the M113 family. Most personnel interviewed felt that HHC should have an M578 light recovery vehicle. The HHC maintenance personnel stated that it was generally difficult to obtain maintenance platoon M88 VTR support because those vehicles were involved in supporting tank companies. Each person interviewed stated the HHC M543 was necessary for motor pool operations and to support wheeled vehicles.

### (4) Tank Company

Each tank company was authorized one M88. Most personnel interviewed stated that this was insufficient. If the M88 became disabled, it left the company without a lift capability. When maintenance periods were scheduled, the lift capability of one vehicle was insufficient to perform all required tasks. Realistically, it was seldom possible to get another recovery vehicle to the maintenance location. As a result, it was felt that an additional tracked recovery vehicle, either an M88 or M578, was needed for its lift capability.

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### (9) Company D

The maintenance section of Company D was not authorized a recovery vehicle. Since the maintenance platoon recovery vehicles were available to support the company, this was not considered a problem.

#### e. M548 Tracked Cargo Carrier

There were differing views on the number of M548's required to support battalion operations. Personnel interviewed in two battalions considered the nine authorized M548's to be insufficient. These units used the M548 for resupply of their elements forward of the FSB. In each of these battalions, an M548 frequently accompanied each tank company and the heavy mortar platoon during combat operations. These vehicles carried extra Class V, rations, repair parts, and other general cargo. Two M548's were used continually for POL resupply, and it was felt that two additional vehicles were needed for this purpose. Three were used for handling Class V and FSB details. Each unit stated that one was needed to carry the maintenance platoon's welding equipment, and one battalion wanted an M548 to carry water. The total assessed need for M548's in these battalions would be 12 or 13, if all stated requirements were to be met on a full-time basis. The other battalion, which had an AO completely accessible by a paved road, had no need for the M548. These vehicles were parked in the unit motor pool. However, personnel in this unit stated that its M548's would be needed if the unit received a mission similar to those performed by the other tank battalions.

#### f. Wheeled Supply Vehicles and Trailers

##### (1) General

All tank battalions utilized their wheeled supply vehicles extensively. The extent of usage depended on availability of roads in the unit AO, the amount of cargo transported within the base camp and forwarded to the FSB, and the amount of base camp/FSB details requiring wheeled cargo vehicles. It was observed that, even when cargo vehicles were not used for organic support, there were constant requirements to support higher headquarters and other units.

##### (2) M54, 5-Ton Cargo Truck

All those interviewed considered the authorization of 12 M54's to be adequate. One battalion used these vehicles exclusively, because the unit AO consisted of a paved highway. The other two battalions moved a large amount of materiel between the base camp and the FSB.

##### (3) M35, 2 1/2-Ton Cargo Truck

Personnel interviewed were satisfied with the authorization of 23 M35's. In some cases, tank company commanders preferred the M548 to the M35 authorized in the company maintenance section.



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### (4) Water Handling Equipment

All personnel interviewed felt the authorized water handling equipment, five 400-gallon water trailers and five 250-gallon collapsible drums, was inadequate. The collapsible drums were considered to be cumbersome and impractical. As a result they were not used. Each battalion had on hand several excess water trailers. One battalion had an M50C, 1200-gallon water truck issued on temporary loan. Another battalion employed two of its authorized tank-and-pump units for water, one mounted on an M54 and one on an M548. Each battalion used 600-gallon tanks for water storage at FSBs and base camps.

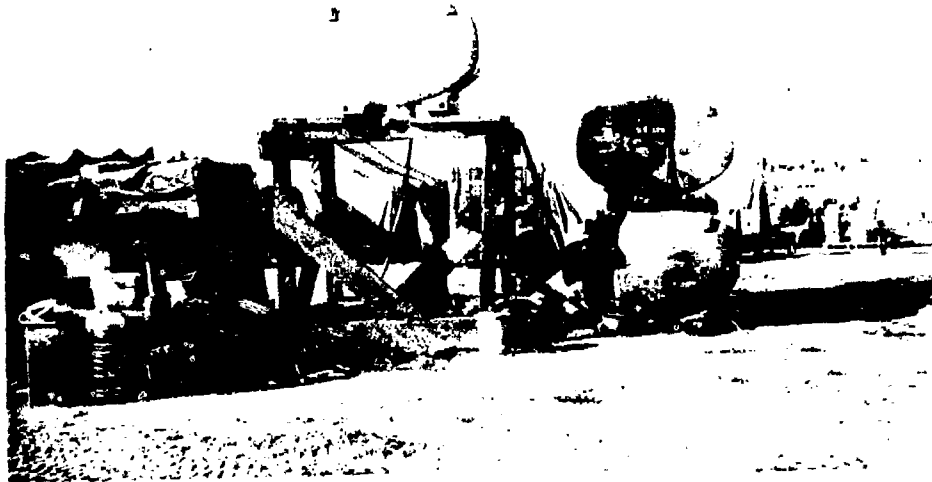


FIGURE J-14 (U). Use of 600-Gallon Tanks for Water Storage at FSB Mess.

This equipment was in constant use supporting mess halls, the base camp, and providing water for tactical elements. Personnel in two battalions stated a requirement for one M50C and five additional water trailers. In the other battalion it was felt that two M50Cs were required.

### g. Administrative Vehicles

Personnel interviewed considered the authorization of 33 M151 utility vehicles to be in excess of unit needs. One battalion had turned in 12 M151's and placed eight more in unit storage. The other units kept a majority of their M151's in the motor pool. Among those M151's specifically mentioned as being in excess to mission requirements were those assigned to the messengers, the heavy mortar platoon, the AVLB section, the tank

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company maintenance sections, and the tank company first sergeants. The radios from these vehicles were used elsewhere.

## h. Countermine/RPG Equipment

### (1) General

As discussed in paragraph 1d, above, mines posed a greater threat to the tank battalions than RPGs. Detonation of a mine generally caused the vehicle to become either inoperable for one to five days or a combat loss, normally from hull damage.

### (2) Countermine Equipment

(a) The tank battalion commanders who had experience with the vehicle-mounted mine rollers in RVN were unimpressed. Their statements concerning the adequacy of available equipment and future requirements paralleled those made by commanders in the ACR.



FIGURE J-15 (U). Tank-Mounted Mine Roller, ENSURE 202.

J-35

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(b) In spite of the fact that engineer mine-sweep teams were used to perform the majority of mine clearing operations conducted by the battalions, commanders considered the authorization for metallic mine detectors to be inadequate. Frequently, mine-sweep teams were not available to sweep an area where randomly emplaced mines had been encountered. A precautionary sweep was established SOP in all units before initiating recovery of a mine-damaged vehicle. Other techniques employed were the same as described in paragraph 3i(2), Annex G. Those interviewed felt that each line platoon, headquarters tank section, and each scout section required one metallic mine detector. The resulting desired BOI was 12 metallic mine detectors in addition to the authorized nonmetallic detectors.

## (3) Belly Armor Kit for M113A1

Two battalions had mounted belly armor kits on their M113A1 APC/ACAVs, while the third expressed an urgent need for them. The consensus among commanders, platoon leaders, and drivers interviewed was that the belly armor caused a slight decrease in cross-country mobility, which was more than offset by increased crew protection.

## (4) Counter RPG Equipment

The main passive RPG protection used by all armor vehicles consisted of chain link fencing whose emplacement, employment, and problems are described in paragraph 3i(4), Annex G. Every commander interviewed stated a requirement for internally mounted passive RPG protection.

### 1. Night Vision Equipment

#### (1) Searchlights

Every commander interviewed, at all levels from platoon through battalion, stressed the requirement for one 23-inch xenon searchlight per tank. The MTOE authorization was five in each tank company, three for the headquarters tank section and, strangely, five for Company D, which had no tanks. This authorization was considered inadequate to support small-unit night operations. All commanders considered a silent power source and "pink-light" capability highly desirable (see paragraph 3j(2), Annex G).

#### (2) Night Vision Devices

(a) Tank battalions were authorized a total of 20 passive night vision devices by MTOE: 12 individual starlight scopes and eight medium-range night observation devices (NOD). None of the commanders interviewed considered this quantity anywhere near sufficient. As a result, each unit had acquired varying quantities of unauthorized devices, mainly crew-served-weapon sights. Two battalions relied on the devices most exclusively for night surveillance, while the third, which had the fewest, relied more on its vehicular-mounted infrared devices. However, the passive vision equipment was considered more useful than infrared devices.

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FIGURE J-16 (U). Tank-Mounted 23-Inch Xenon Searchlight.

(b) All personnel interviewed considered it essential to have a minimum of one night-vision device per tracked vehicle. The average desired BOI for the three battalions was: one crew-served-weapon sight per tank, mortar carrier, and scout M113A1 APC/ACAV, for a total of 68 in the battalion; one NOD per line company, two for the scout platoon, and three for headquarters company, for a total of eight in the battalion; and three individual type starlight scopes per tank platoon, three per scout section, and 15 per headquarters company, for a total of 48 in the battalion.

(3) Infrared Equipment

(a) Two battalions made little use of their tank-mounted infrared fire control systems or xenon searchlights in the IR mode, for the reasons discussed in paragraph 3j(4), Annex G. The third battalion relied on its infrared equipment for two reasons. First, the unit was subjected to the northeast monsoon, whose heavy cloud cover significantly reduced natural ambient light levels during a portion of the year. Second, this battalion had been unable to obtain sufficient passive night vision devices to supplant its IR capability. However, even in this unit, the M34/36 tank commander's sight was not used because it was blocked by the externally mounted caliber .50 machinegun (see Annex O).

(b) The driver's infrared was rarely employed. In addition to equipment damage resulting from "jungle busting," commanders considered it impractical for cross-country use due to lack of depth perception.

J-37

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## (4) Night Movement Capability

No equipment inadequacies were encountered that affected this capability.

## J. Weapons

### (1) General

Commanders were generally satisfied with the various weapons authorized, except those noted below.

### (2) M48A3 Machineguns

One commander was satisfied with the authorized mix of tank machineguns. The other two commanders felt that the loader required an additional machinegun for left flank and rear security. Everyone from tank commanders through battalion commanders stated that the caliber .50 machinegun should be mounted externally on the tank commander's cupola.

### (3) M48A3 Individual Crewmen Weapons

Each M48A3 crew was authorized four caliber .45 pistols and two caliber .45 submachineguns. This authorization was considered unsatisfactory for the reasons explained in paragraph 3k(3), Annex G. Commanders generally felt that one M79 grenade launcher and either three CAR-15's or M16 rifles would be more desirable.

### (4) Scout Platoon Weapons

(a) Commanders felt the scout platoon required additional firepower. A 40mm automatic grenade launcher was desired for suppressive area fire to supplement the direct fire of the caliber .50 machineguns. Also, in populated areas it could be employed more safely than the caliber .50 machinegun. It was felt that one grenade launcher per scout section would satisfy this requirement.

(b) All commanders expressed interest in the XM191 multi-shot flame weapon (XM202 launcher and XM74 rocket clip). They stated that this weapon could provide the flame capability the battalion needed. On that basis, they requested that each scout squad be equipped with one XM202 launcher.

### (5) Machineguns

As indicated in paragraph 5c(1), Annex B, there was a substantial number of unauthorized machineguns in two battalions. These weapons were considered essential to meet rear area security requirements without taking weapons from the combat elements.

J-38

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## k. Communications Equipment

### (1) General

The quantitative adequacy of authorized communications equipment was difficult to assess. The tank battalions were generally able to maintain effective communications. As indicated in Appendix 2 to Annex C, there was substantial unauthorized equipment on hand. The communication equipment requirements were a function of the interrelationships between the level of communication equipment repair authorized, varying operational requirements, and equipment usage for purposes other than intended, as discussed in Annex P. The identifiable finite problems are addressed in this paragraph. An analysis of the corporate communications issue is included in Section III.

### (2) FM Radios

#### (a) Battalion Headquarters

The number and location of radios required in the three battalion headquarters varied with the requirements of the controlling headquarters, liaison requirements, base camp/FSB security requirements, mission variations, and other factors. At the time of the evaluation, each battalion was operating in from five to eight FM nets, three or four of which were secure or had a secure capability. Diagrams of the nets and equipment used by these units are presented in Annex P. In addition, each battalion was required to monitor up to three additional nets. As a result, the battalions remained flexible in configuring their assets to meet requirements. Because of this, it was impossible to precisely identify what additional equipment was needed. The RVN operational environment generated communications requirements over conventional requirements. Figure J-17 summarizes the total quantities of major items of FM equipment authorized and utilized by the battalion headquarters companies.

TYPE EQUIPMENT	AUTHORIZED	UTILIZED		
		1/69	1/77	2/34
AN/VRC-12	3	3	2	2
AN/VRC-46	21	24	23	20
AN/VRC-47	13	13	17	18
AN/VRC-49	1	1	1	1
AN/VRC-53	8	10	6	3
TSEC/KY-8	2	2	2	2
TSEC/KY-38	0	2	3	7

FIGURE J-17 (C). Utilization of FM Radio Equipment in the Tank Battalion HHCs (U).

J-39

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## Mounted Vehicle Radios

The authorization of a single AN/VRC-12 command radio was considered inadequate by commanders at all levels. Therefore, virtually all battalion, company, and platoon command tanks with ACAVs had been equipped with two receiver-transmitters. The rationale for the additional equipment was to provide the commanders with the capability to maintain continuous communications in two nets.

### (c) Tank Platoon Radios

In addition to the requirement for command radios, commanders stressed the requirement for portable radios. Portable radios were considered necessary to provide nighttime communications in mounted or dismounted ambushes, OPs and LPs. This would preclude having to run vehicle engines. Company commanders stated that two AN/PRC-25/77 radios per tank platoon would be sufficient.

### (d) Scout Platoon Radios

No portable radios were authorized by MTOE for the battalion scout platoon. Commanders at all levels considered portable radios essential to provide the platoon necessary silent and dismounted communications capability. The average quantity requested by the three battalions was eight AN/PRC-25/77 radios per platoon.

### (e) Mortar Platoon FDC Radios

The mortar platoon FDC M577A1 was authorized one AN/VRC-47 and one AN/VRC-53 by MTOE. This was inadequate to maintain communications in three nets (battalion command, artillery fire request net, and platoon command) and to monitor up to two additional nets (supported company net and logistical net). Mortar personnel interviewed stated that replacement of the AN/VRC-47 with an AN/VRC-44 would provide the required capability.

### (f) Support Platoon Radios

Commanders and logistical personnel interviewed expressed a requirement for portable radios in the M548's and for control of air resupply operations [paragraph 2c(3), above].

### (g) Communications Accessories

Platoon leaders and company commanders expressed a desire for handsets, headsets, and speakers for use with the vehicle-mounted radios. Night security guards, wearing CVC helmets, were unable to hear any outside noises.

J-40

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## (h) Secure Equipment

1. As indicated in Figure J-17, on-hand secure communications equipment in each battalion headquarters exceeded authorizations. Heavy reliance on secure FM for the battalion command net and, in two units, the administration and logistics net, multiplied requirements for secure communications equipment.

2. Each battalion had varying quantities of secure equipment on hand, either in use or as operational floats. This ranged from 6-13 TSEC/KY-8's and TSEC/KY-38's. In each battalion, the quantity on hand was considered insufficient. Without considering the qualitative and interface problems discussed in Annex N, commanders agreed that 29 was the minimum quantity required for the entire battalion. However, two battalion commanders and most company commanders said that, once interface problems had been solved, secure capability should extend down to platoon level. Figure J-18 shows the desired location of secure equipment in the two suggested BOIs, one for austere command and control, and one to include platoon level.

LOCATION	MINIMUM REQUIREMENT	REQUIREMENT TO INCLUDE PLATOON LEVEL
Bn CO	2	2
Bn XO	1	1
S2 M577A1	1	1
S3	2	2
S3 Operations	2	2
S1/S4	2	2
S5	1	1
Arty LNO	2	2
LNOS	2	2
HHC	1	2
Tank Company CO	1 (3)	1 (3)
Tank Company XO	1 (3)	1 (3)
Tank Company	1 (3)	4 (3)
Scout Platoon	1	2
Mortar Platoon	2	2
Support Platoon	1	1
Totals	29	40

FIGURE J-18 (C). Stated Requirements for Secure Equipment in the Tank Battalions (U).

3. In each battalion, the artillery liaison team and FO teams with the line companies borrowed secure equipment. Every commander considered it essential that the artillery nets have a secure capability.

J-41

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## (3) AM Radios

All commanders interviewed considered the MTOE authorizations for AM radio/PTT equipment adequate. There was no requirement for AM voice nets.

## (4) Rectifiers

Personnel interviewed expressed a requirement for four additional PP1104/G rectifiers to provide DC power for radios used in FSBs and base camps.

## (5) AB-577 Antenna Base

In two battalions AB-577's had been obtained. Each battalion considered two AB-577's to be highly desirable, one for the battalion forward TOC and one for the rear CP. The advantages of the AB-577 are discussed in paragraph 31(5), Annex G.

## 1. Early Warning Equipment

### (1) Radar Equipment

Two commanders were satisfied with MTOE authorizations for two FPS-5 radar sets, while the third wanted the authorization increased to six.

### (2) Early Warning Devices

Tank battalions were not authorized any type of electronic anti-intrusion devices by MTOE. However, each battalion had on hand at least one patrol seismic intrusion detector (PSID). Personnel familiar with the employment and capabilities of the PSID felt that there should be one per line company and two in the scout platoon.

## m. Navigation Equipment

Navigation in dense vegetation was a continuing problem in the tank battalions. The problem and suggested solutions were identical to those discussed in paragraph 3n, Annex G.

## n. Accessory Equipment

### (1) General

Each battalion commander believed several accessory items of equipment were needed that were not authorized by the MTOE. Those warranting discussion are considered below. Each battalion also had certain items authorized which were not required. These items are enumerated in Appendix 3 to Annex G.

J-42

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## (2) Equipment Requested

### (a) Steam Jenny

Commanders and maintenance personnel in each tank battalion considered a steam jenny a requirement in the battalion maintenance platoon.

### (b) Air Loading Equipment

Air loading equipment was not authorized by TOE/MTOE. However, USARV letter authorization had provided each unit with this equipment. Clarification of authority for and quantities of air items constituted the problem.

### (c) M109, 2 1/2-Ton Van Truck

Each battalion commander considered M109 vans a requirement for the conduct of efficient maintenance operations. One battalion had three and another had two on hand. These vehicles were used as tool rooms, repair parts rooms, and shop offices. Maintenance personnel stated that two were required in the maintenance platoon and one in the HHC maintenance section.

### (d) POL Handling Equipment

#### 1. Fuel Transfer Pumps

Although none of the tank battalions were conducting extensive air resupply during the evaluation, all persons interviewed stated at least five portable fuel transfer pumps were needed. Some units had fabricated POL pumps from the 44 GPM bilge pumps installed in the M113A1.

#### 2. Delivery Equipment

Only one battalion commander felt there was a requirement for an additional M49C 1200-gallon fuel truck in the battalion support platoon. The two authorized drum-and-pump units were not considered sufficient for field delivery of POL. It was stated that four units were needed, one to be mounted on each side of the four M548's which were recommended for POL resupply.

### (e) On-Vehicle Recovery Equipment

The problem cited for self-recovery of combat vehicles in the ACR applies to the tank battalion. Unit personnel stated that one tow bar per platoon/section and two heavier 20-foot tow cables per vehicle were needed.

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## ANNEX K

### MECHANIZED INFANTRY BATTALIONS

#### 1. (C) EMPLOYMENT

##### a. Missions

The missions assigned to mechanized infantry battalions generally were similar to those assigned to other armor-equipped units in RVN. However, by possessing a dual armor/infantry capability, mechanized battalions had the flexibility to accomplish a greater variety of missions. They were able to capitalize on their armored firepower and mobility, while at the same time retaining their capability to function as dismounted infantry. The AOs assigned to mechanized infantry units were generally smaller than those assigned to cavalry squadrons, but were significantly larger than regular infantry or tank battalion AOs. Figure K-1 shows the location of mechanized infantry battalions during the evaluation. Employment varied considerably from one Corps Tactical Zone to another. Within III Corps, where six of the battalions were located, there were wide differences in employment, particularly at night and for security operations. Figure K-2 shows the relative combat strengths of each battalion committed to each type of mission during the evaluation. Because of wide variations in local techniques and terminology, types of missions have been grouped into broad general categories for clarity. Like other armored units in Vietnam, mechanized infantry battalions had a continuing secondary mission to act as a ready reaction force. Additionally, the battalions emphasized small-unit combined operations whose purpose was improving the combat capability of ARVN and local RF and PF units. Units in or near populated areas emphasized support of local efforts to eliminate the Viet Cong infrastructure (VCI).

##### b. Organization for Combat

(1) Contrary to conventional doctrine, cross reinforcement of mechanized infantry with tank units was the exception rather than the rule. More frequently, but not to the extent found during the MACOV evaluation in 1966-67, mechanized infantry companies or platoons were used in a tank-like role to reinforce regular infantry units. This was particularly true in the III CTZ area. Since mechanized battalions operated in three of the Corps areas, under five different tactical headquarters, a typical task organization could not be accurately depicted. Local differences in terrain, vegetation, population density, enemy threat, and types of US forces available contributed to variations in task organization. Figure K-3 shows the average availability of both organic elements and attachments during the evaluation. These are summarized below by major command.

K-1

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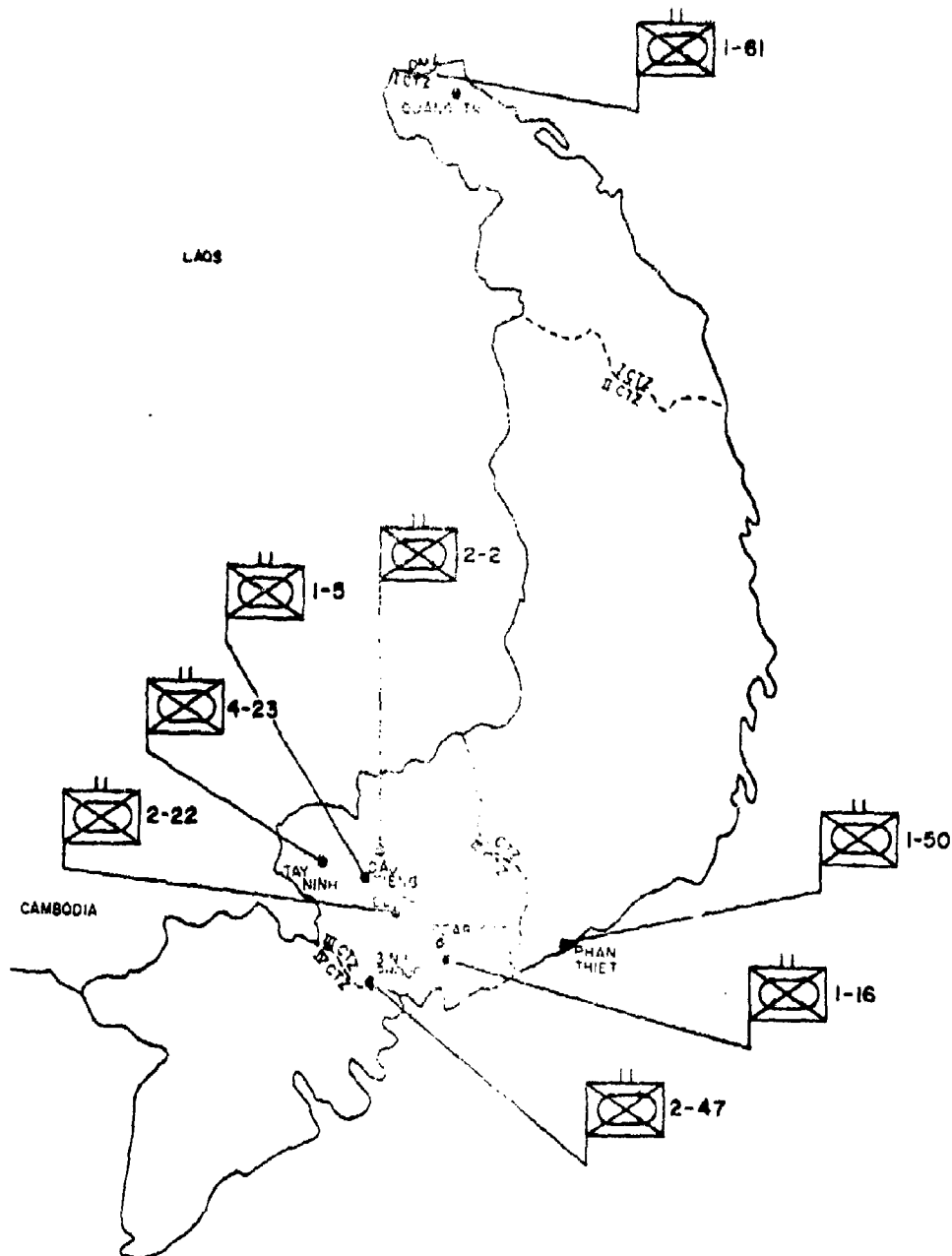


FIGURE K-1 (C). Location of Mechanized Infantry Battalions  
During the Evaluation. (U)

K-2

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CTZ	HQ	UNIT(2)	(3)	DAYLIGHT MISSIONS (1)							NIGHT MISSIONS		
				RECONNAISSANCE OPERATIONS	SECURITY OPERATIONS	RAPID REACTION FORCE	MAINTENANCE STAND DOWN	ROAD CLEARING	CORDON AND SEARCH	CIVIC ACTION	OTHER MISSIONS	NIGHT SECURITY	NIGHT DEFENSIVE POSITIONS
I	1ST BDE 5 INF (M)	1/61	55	43	5	20	6	0	1	0	62	28	10
II	TF SOUTH	1/50	76	45	13	4	3	0	0	0	80	11	9
III	1ST INF DIV	1/16	80	4	0	12	0	0	0	(5) 7	10	38	55
		2/2	89	14	0	11	1	1	0	0	8	39	55
	25TH INF DIV	1/5	79	16	0	7	0	0	0	0	23	28	52
		2/22	58	47	0	2	46	3	7	0	53	22	25
		4/23	42	10	7	26	22	0	0	0	52	9	39
	3RD BDE 5 INF DIV	2/47	87	8	1	35	22	3	0	0	17	19	84

- NOTES: (1) See Glossary of Terms, Annex A, for mission definitions.  
 (2) Total percent is greater than 100 percent due to the commitment of combat elements to more than one mission per day.  
 (3) Includes dismounted ground reconnaissance from air assault as well as mounted/dismounted operations.  
 (4) Includes time spent resting from or preparing for night operations.  
 (5) Movement to new AO and set up new support base.

FIGURE K-2 (C). Average Combat Power Committed to Types of Missions. (U)

K-3

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		ORGANIC COMBAT ELEMENTS										OPCON COMBAT ELEMENTS										MISCELLANEOUS COMBAT ELEMENTS					ARVN/RF UNITS
		ONE MECH CO	TWO MECH CO'S	THREE MECH CO'S	SCOUT PLATOON	MORTAR PLATOON	FLAME PLATOON	ONE INF CO	TWO INF CO'S	ONE TANK CO	TWO TANK CO'S	ONE TANK PLATOON	ARMORED CAV PLATOON	INFANTRY PLATOON	ENGINEER DML TEAMS	SCOUT DOG TEAMS	M42 DUSTER SEC	ONE COMPANY	TWO COMPANIES	THREE COMPANIES							
I	1ST BDE 5 INF (M)	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100						
II	TF SOUTH	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100						
III	1ST INF DIV	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100						
	2/2	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100						
	1/5	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100						
	25TH INF DIV	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100						
	3RD BDE 9 INF	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100						

NOTE: All figures are expressed as percent of time units were available.

FIGURE K-3 (C). Average Available Combat Power, Mechanized Infantry Battalions. (U)

K-4

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## (a) 1st Brigade, 5th Infantry Division (Mechanized)

The 1st Battalion, 61st Infantry had the more conventional organization for combat. One mechanized rifle company was normally detached, while at least one, and frequently a second, tank company was attached. When additional dismounted capability was required, a regular infantry company was also attached. Because the battalion possessed the only operational mechanized flame platoon in the brigade, it was frequently detached. Engineer mine-sweep teams were attached to each company, since the battalion was operating where there was a significant mine threat (near the DMZ).

## (b) Task Force South

The 1st Battalion, 50th Infantry rarely detached any of its organic elements. The battalion frequently operated with one to three ARVN or RF companies. Also, it occasionally received a cavalry platoon from the squadron assigned to the Task Force.

## (c) 1st Infantry Division

The different types of AOs assigned to the two mechanized battalions of the division caused a considerable variation in task organization. The AO of the 2d Battalion, 2d Infantry was characterized by dense jungle and rubber plantations. The battalion habitually detached one company to reinforce a regular infantry battalion in the brigade, while one regular infantry company was nearly always attached for air assaults. Additionally, it frequently operated with a tank platoon and at least one ARVN or CIDG company. The 1st Battalion, 16th Infantry, which operated in more open jungle, infrequently detached organic elements. When required for special operations in the Rung Sat Special Zone, the battalion received infantry for use in waterborne ambushes.

## (d) 25th Infantry Division

The organizations for combat of the three mechanized infantry battalions of the division were quite similar. While one battalion never detached any of its organic elements, the other two occasionally detached one company to reinforce regular infantry battalions and to provide ready reaction forces elsewhere in their brigade or division AO. Infantry companies were frequently attached for air assault or static security. Although these battalions rarely controlled ARVN or RF companies, they all worked in close coordination with local forces. They all normally received engineer mine-sweep teams. The three battalions rotated the responsibility for providing a mechanized rifle platoon with the 2d Battalion, 34th Armor.

K-5

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## (e) 3d Brigade, 9th Infantry Division

The 2d Battalion, 47th Infantry, usually retained control over all its organic elements. Because boobytraps constituted the biggest threat in the battalion AO, engineer demolition teams were attached to each company. Combined operations were conducted regularly with joint ARVN and RF units.

(2) In addition to the organic and attached units indicated in Figure K-3, the mechanized infantry battalions also had access to non-organic fire support. During the evaluation, the battalions averaged 13 artillery fire missions, 0.6 armed helicopter sorties, and 0.5 close air support missions daily. All commanders considered this support adequate, although occasionally not responsive.

### c. Tactics

#### (1) General

The mechanized infantry battalions employed greater variations in tactics for a given type of mission than other armored units in RVN. As with all units, the basic purpose of any operation was to seek out the enemy, find his base camps and caches, interdict his movement, and destroy him. All commanders agreed that finding the enemy was the major tactical problem. When in the vicinity of mechanized forces, the enemy usually dispersed his units into small groups, rather than encounter the massed firepower and mobility of the mechanized unit. While some techniques were common to all mechanized battalions, local variations and adaptations were widespread. These divergent operational techniques resulted from many factors: differences in terrain, vegetation, and enemy threat in the unit AO; local population density, seasonal trafficability, and maneuver restrictions; and the availability of other US forces. The size of the individual maneuver elements employed was dependent upon the enemy threat. In III CTZ most operations were of platoon size, while in I CTZ company-size or larger operations were the rule.

#### (2) Reconnaissance Operations

##### (a) General

The majority of operations conducted by mechanized infantry battalions were basically reconnaissance in nature. As with the tank battalions, such operations were usually conducted either along a well-defined axis or within specified boundaries. In most mechanized battalions, there was also considerable emphasis on dismounted movement, sometimes in conjunction with the carriers or, at other times, widely separated from the carriers.

K-6

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## (b) Mounted Reconnaissance

1. In most battalions, mounted reconnaissance was limited to open paddy land, rubber plantations, and areas of light scrub vegetation. In many areas, daylight mounted reconnaissance produced few tangible results. However, mounted reconnaissance was considered useful to cover large areas rapidly for a show of force and to deny the enemy freedom of movement. When any sign of enemy activity was discovered, elements immediately dismounted to conduct a detailed search of the area.

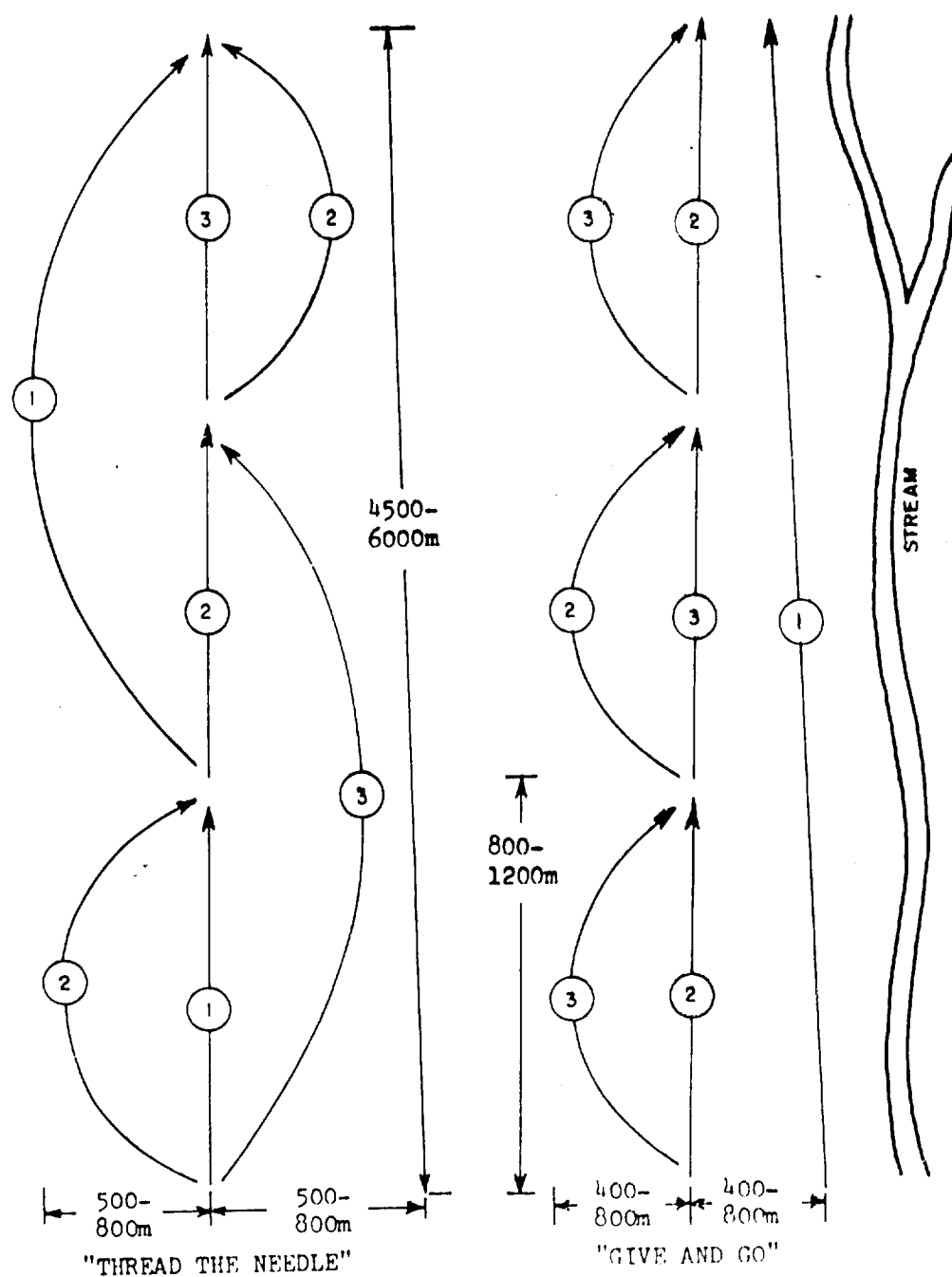


FIGURE K-4 (U). Mechanized Rifle Company Show of Force.

2. Most commanders felt that mounted reconnaissance elements had little chance of making contact, as the noise of the approaching tracked vehicles provided the enemy ample warning to evade detection. This led to development of certain techniques in which the mounted elements moved through an area employing reconnaissance by fire in an attempt to make the enemy move, generally away from the flanks of the direction of movement. By using techniques shown in Figure K-5, mechanized infantry elements frequently caused the enemy to move into the path of another mounted element or into dismounted infantrymen operating on the fringes of the mounted search area. The two battalions of the 1st Infantry Division frequently

K-7

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#### LEGEND

- Axis of Movement
- ① 1st Plt
- ② 2d Plt
- ③ 3d Plt

FIGURE K-5 (U). Typical Mechanized Infantry Company Mounted Reconnaissance Patterns in Jungle.

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capitalized on this tactic in dense jungle. However, both of these units dismounted to perform detailed searches whenever indications of enemy activity were discovered.

## (c) Mounted/Dismounted Reconnaissance

1. The most common form of reconnaissance conducted by mechanized units was a combination of mounted and dismounted movement. In this type operation the M113A1 APC/ACAVs were used as transportation to the area to be searched. At this point, the infantry dismounted to conduct their reconnaissance. Depending upon the unit and characteristics of the AO, the M113A1 APC/ACAVs were then used in a variety of ways:

a. In areas where boobytraps constituted a major threat, the tracked vehicles led the dismounted personnel, reducing casualties by detonating the devices. In other areas where vehicular mines posed the greatest danger, infantrymen preceded the vehicles conducting a visual search for mines. Under these circumstances the column formation was used to minimize mine danger and the number of troops involved in looking for them.

b. Some battalions used the M113A1 APC/ACAVs as a separate maneuver element, either to follow and support the dismounted infantry by fire or as a reaction or blocking force. When used in this fashion, a two-man crew, consisting of the driver and the caliber .50 machinegunner, remained on the carrier. Other battalions utilized a variety of techniques, including having the tracked vehicles leave the immediate area for deception purposes or acting as a stirring force within a cordon of dismounted infantry. Several units employed "stay behind" daylight and night ambushes to take advantage of the enemy's tendency to return to a previously cleared area.

2. Some units assigned AOs to companies, which were in turn divided into platoon AOs to provide maximum area coverage. Figure K-6 shows one technique used in an area where the enemy threat was confined to small groups. The basic principles followed were that the platoons remained within 81mm mortar range of the company CP and that the mounted elements of the platoon stayed within reinforcing distance of the dismounted squad-size search teams. It was believed that this technique provided maximum coverage while maintaining the capability to mass rapidly when required.

3. Combined mounted/dismounted reconnaissance in conjunction with regular infantry proved extremely successful. The mounted elements covered large areas during the daylight hours, denying the enemy freedom of movement. This was followed at night by dismounted infantry saturating the same area with ambush patrols, which could be easily reinforced by the mechanized elements.

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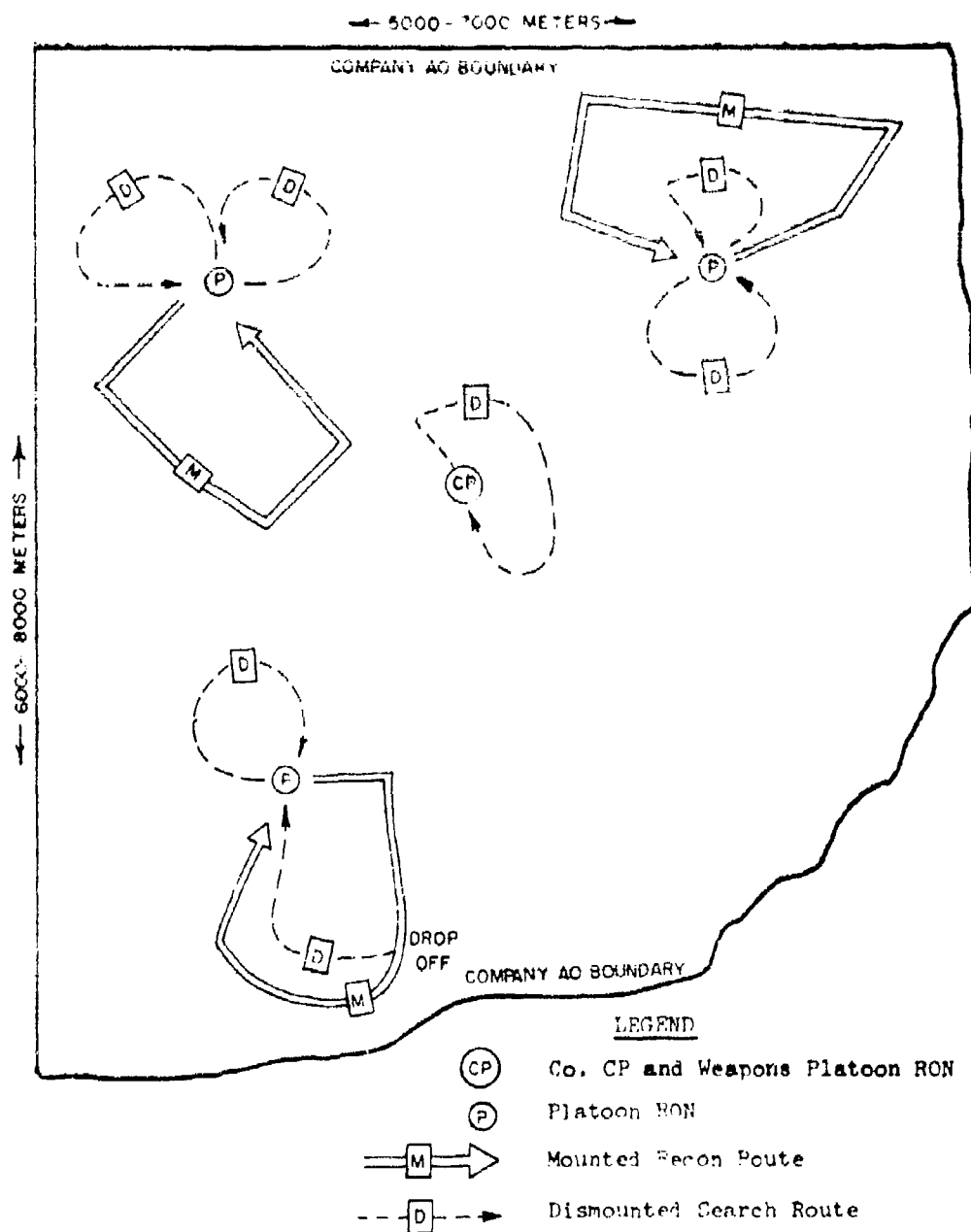


FIGURE K. (U). Typical Mechanized Infantry Company/Platoon Mounted Reconnaissance and Dismounted Search Routes.

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## (3) Security Operations

(a) Most security operations conducted by mechanized infantry battalions were for the purpose of securing FSBs, base camps, roads, and populated areas. Units attempted to meet these requirements with a minimum number of personnel. In most areas, daylight static security requirements were negligible; however, night security of fixed installations often involved a major portion of the unit's combat power. Two units employed a mobile screen of night ambush patrols that moved two or three times a night. In other battalions, units ranging in size from platoon to company returned to the FSB or base camp to provide the necessary security. In all battalions, elements on maintenance standdown were utilized to fulfill fixed security and RRF requirements.

(b) Engineer land-clearing companies were secured by performing reconnaissance around the Rome Plow operation. Two battalions had employed attached Rome Plows offensively in dense jungle. When an enemy element was located, the area was sealed off by the mechanized elements while the plows cut decreasing circular swathes out of the jungle.

## (4) Road and Mine Clearing Techniques

(a) Infantry commanders stated that mine incidents generally increased if a unit remained in one AO for an extended period. In one AO, the enemy had successfully denied the battalion its cross-country mobility. Virtually all tracked movement in that unit had to be preceded by dismounted infantry and engineer mine-sweep teams.

(b) Several active and passive techniques were developed to combat the mine threat. One battalion had virtually eliminated the threat on the roads in its AO by coordinated use of electronic sensors, radar, ambushes, artillery fire, and immediate reaction. Small sensor fields were placed in areas of previous mining activity. Radar was used to supplement the sensors and provide surveillance on more open stretches of the road. Whenever a single sensor activation was noted, 15 rounds of artillery were fired at the location. If multiple activations were received, 45 rounds of artillery were fired and a reaction force was dispatched to sweep the area. In both cases, rapid response was essential for success. Ambushes were also used to supplement electronic surveillance devices.

(c) Other techniques employed by mechanized infantry battalions to accomplish routine road clearing operations were basically the same as those employed by the ACR, paragraph 1c(2), Annex G. In comparison to the cavalry platoon, the mechanized rifle platoon, with its smaller size, could perform little more than the mine sweep. Therefore, if a road had to be secured after it had been swept, at least two platoons, and sometimes a full company, were needed.

K-11

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(d) Several passive defense measures were employed against mines. These included use of extended steering laterals for the M113A1 drivers, movement in column formations, using only a two-man crew on the lead vehicle, and avoiding any previously used tracks or trails. While these measures reduced casualties, none solved the problem.

## (5) Rapid Reaction Force

All mechanized infantry battalions were successfully employed as rapid reaction forces. Their inherent ability to react at night more rapidly, in greater strength, and with more sustaining power than airmobile infantry was capitalized on to extract ranger LRRP teams and to reinforce other infantry units, local ARVN, RF/PF compounds, and special forces camps.

## (6) Night Operations

### (a) General

Emphasis was placed on night operations. As indicated in Figure K-2, there was substantial variation in relative commitment of combat power to various types of night missions. Most of these operations consisted of the establishment of numerous small mounted and dismounted ambushes in conjunction with platoon and company NDPs.

### (b) Night Defensive Positions

1. Every battalion employed fairly elaborate NDPs to provide the required all-around security. NDPs served many purposes, such as temporary operational bases, mortar fire support bases, field CP locations, or one-night laagers. Regardless of the type of terrain and vegetation, all NDPs had common characteristics.

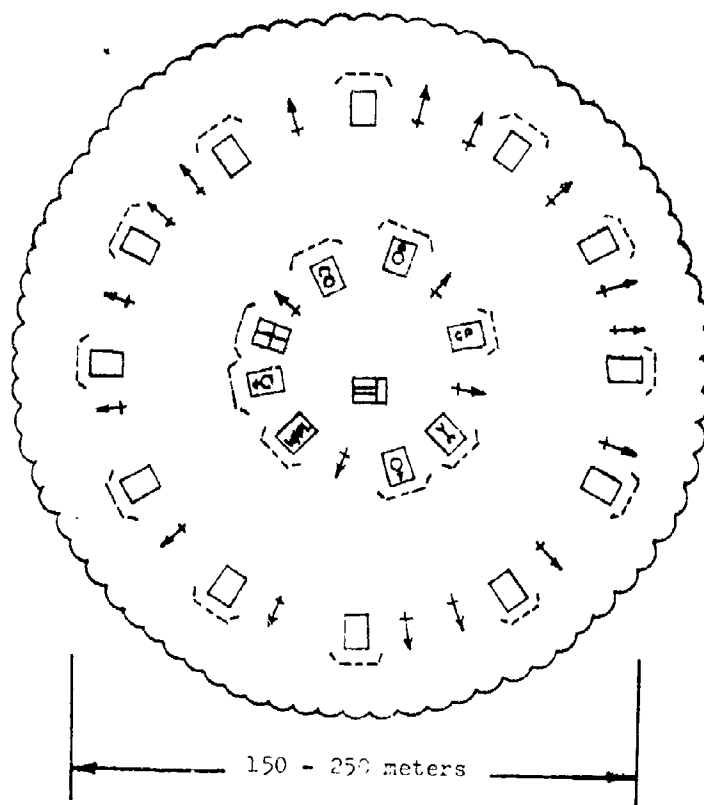
2. Figure K-7 shows a typical mechanized infantry company NDP. All direct fire weapons were oriented outward, while the mortars were positioned to provide immediate fire support in all directions. The two concentric perimeters formed by the carriers enabled the CP group, the mortars, and the maintenance section to provide their own security when the rifle platoons were employed elsewhere. The outer perimeter was encircled by concertina wire, with each vehicle crew setting out an average of three claymore mines immediately behind the wire. In six of the eight battalions, PPG screens were emplaced nightly. Early warning was provided by tripflares, PSIDs, and radar when available. One man remained on each vehicle in the TC cupola for security, employing a passive night vision device for surveillance. Each squad dismounted one M60 machinegun for use in the fighting positions established between the vehicles. Alert units using NDPs of this type proved that they could withstand numerous determined enemy assaults with relatively few friendly casualties while taking a heavy toll of the attackers.

K-12

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LEGEND

	M113A1 Rifle Squad		Concertina
	Company Commander		RPG Screen
	Company Maintenance		M60 MG
	Company CP		
	Medical Evacuation		
	Weapons Platoon Leader (Mortar FDC)		
	Mortar Carrier		
	M578		

FIGURE K-7 (U). Typical Mechanized Rifle Company NDP.

K-13

CONFIDENTIAL

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3. Platoon NDPs employed in areas where the threat was lower used the same techniques. In either case, night ambushes were taken or sent out from these positions and the NDP provided an RRF.

## (c) Ambushes

1. Most mechanized companies preferred to employ five- to nine-man dismounted ambushes to saturate an area of known enemy activity. In some units, these ambushes were emplaced using the stay-behind principle, while, in others, the ambush party was taken to a rally point, from whence it proceeded on foot to the ambush site after dark.

2. Manned ambushes were supplemented by unmanned mechanical (automatic) ambushes. Mechanical ambushes were used by half the battalions with effective results. Where movement by civilians was restricted, the employment of mechanical ambushes was enhanced. They were composed of one to six M18A1 Claymore antipersonnel mines set up for tripwire initiation, usually employing a mousetrap or clothespin to complete an electrical firing circuit. Figure K-8 illustrates a typical mechanical ambush. In one battalion, one section of the scout platoon was tasked with operation of a series of 60 - 80 mechanical ambushes in a known enemy movement and harboring area.

3. Dismounted night ambushes were used more extensively than mounted ambushes, because they were more successful. In most units, mounted ambushes were positioned primarily to reinforce the lighter dismounted ambushes.

4. The mechanized battalions in III Corps emphasized night operations. In four battalions, one or more platoons from each company stood down in the afternoon for maintenance and preparation for night ambushes. In another battalion, two full companies were employed every night. In populated areas, covert emplacement of ambushes was difficult because local civilians occasionally informed the enemy of the ambush location. This caused several units to wait until after curfew before establishing dismounted ambushes. The curfew also facilitated identification of the enemy. Figure K-9 illustrates a company ambush operation in a heavily populated area. Since most enemy movement in this unit's AO consisted of small groups of NVA replacements for local VC units, the M113A1 APC/ACAVs were sometimes camouflaged to resemble houses. This deceptive technique occasionally proved successful when NVA came out of the nipa palm to find rice.

5. Ambush activities accounted for the majority of enemy kills in all battalions except one.

K-14

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## (d) Night Movement and Illumination

1. All but one mechanized battalion had conducted some mounted night movement. The percentage of nights on which these battalions moved a platoon-size element, or larger, ranged from five to 100 percent. The majority of moves were either reaction to contact, response to intelligence, or completion of a daylight move. Two battalions had twice moved in mass responding to radio research or airborne infrared detector intelligence reports. Night movement was generally accomplished with the aid of moonlight or blackout drive and, on occasion, with flares.

2. Two battalions used M151-mounted xenon searchlights to provide additional illumination. The 1/4-ton's were transported in M548's for added cross-country mobility. Three other units received direct and indirect illumination from a 30-inch xenon searchlight located on top of a mountain. This illumination was considered a useful and effective adjunct to organic illumination, and it enhanced the effectiveness of night surveillance devices.

## (7) Combined Operations

(a) The mechanized infantry battalion placed greater emphasis on combined operations than did other armored units. Combined operations ranged in size from battalion to platoon, with the latter occurring most frequently. Normally, the US and Vietnamese elements maintained unit integrity, functioning as separate elements within the overall maneuver force. Several techniques evolved which fostered combined operations.

(b) One battalion made one mechanized rifle company available to the district chief for employment when needed. In this way the planning and coordination was accomplished by local authorities, who then conducted the operation. This battalion also provided a combined reconnaissance and intelligence platoon (CRIP) for permanent operation under the district chief. The CRIP in turn provided the battalion with timely and accurate local intelligence. The platoon was composed of both US and Vietnamese personnel.

(c) Two battalions frequently placed their scout and flame platoons under operational control of local authorities. In addition, they frequently conducted company- and platoon-size combined reconnaissance, cordon and search, and security operations. In populated areas, daylight combined operations were more successful than similar operations conducted by US units alone.

(d) One battalion collocated its forward CP with the local district headquarters to facilitate the planning and coordination of combined operations. In this battalion, nearly all platoon-size operations were combined, including ambush patrols. Prior to the CP relocation, the local forces had habitually remained in static security positions.

K-17

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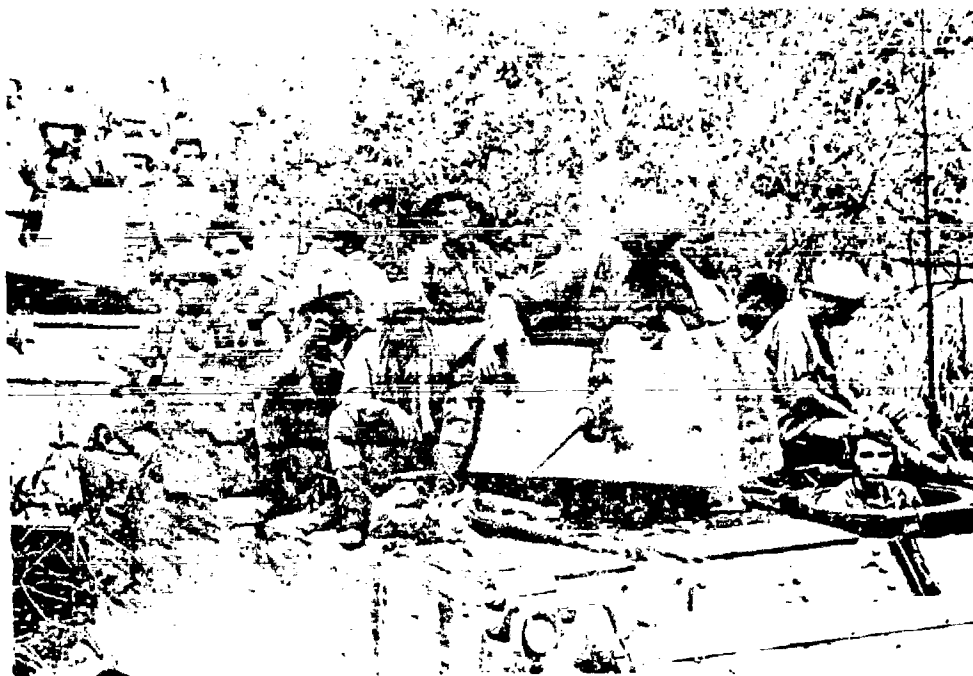


FIGURE K-10 (U). Mechanized Rifle Platoon Combined Operation.

(e) Another battalion frequently conducted integrated combined operations with ARVN and RF companies. This was accomplished by integrating US and ARVN platoons with alternating chain of command positions. This unit also provided US contact or advisory teams to local RF units, consisting of a liaison officer, forward observer, radio operators, two NCOs, a sniper, and three or four infantrymen.

### (8) Other Operations

#### (a) General

Mechanized infantry battalions were frequently assigned missions that did not fully utilize their inherent firepower and mobility. Assignment of such missions was determined by such factors as nonavailability of other infantry to perform required missions and inaccessibility of the objective area to tracked vehicles.

#### (b) Air Assaults

Six of the eight mechanized infantry battalions participated in airmobile assaults during the evaluation. In one battalion,

K-18

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one company was always employed in this manner. The enemy rapidly determined areas inaccessible to the carriers and habitually utilized these areas for base camps, caches, and rest areas. Therefore, air assaults were periodically conducted to deny the enemy these sanctuaries. During these operations units retained a two-man crew on each M113A1 APC/ACAV for maintenance and to provide a light mounted reaction force. The other units left only one man per vehicle, to perform maintenance.

### (c) Dismounted Operations

Several battalions dismounted one or more companies for extended periods to conduct saturation patrolling ("bushmaster") operations. At other times, battalions conducted extended operations in areas inaccessible to tracked vehicles.

### d. Enemy Contact

(1) The level of enemy activity throughout the evaluation was low. The mechanized infantry battalions averaged contact every second day during the 40-day data collection period. Three battalions accounted for 59 percent of all enemy contacts. The remaining five units averaged contact every fifth day. Each contact for all units resulted in an average of two enemy KIA. Of the enemy contacts, 46 percent were with an enemy force of unknown size; 37 percent with squad-size units; 5 percent with platoon-size forces; and 12 percent with a company-size force or larger.

(2) The enemy threat faced by the mechanized infantry battalions ranged from small remnants of local force units to full-strength NVA battalions near the DMZ. The mechanized infantry battalion near the DMZ faced a constant threat from enemy artillery and mortar fire from within the DMZ or from North Vietnam. In fact, whenever an element halted or had to recover a mired or mine-damaged vehicle, they could expect to receive indirect observed fire. No other mechanized battalion faced this threat. The other battalions normally received indirect fire attacks only when in a fixed location.

(3) Six commanders considered mines the greatest threat they faced, while the other two commanders considered boobytraps a greater danger, having taken 90 percent of their casualties from that source. Mechanized infantry units encountered a total of 32 mines, only 13 of which were detected, generally by visual means. The remaining 19 mines were detonated, seriously damaging or destroying vehicles. The majority of the mines detonated were off the road. Mines of all sizes, from 10-pound basket type to 750-pound bombs, were encountered, with one of the latter size having completely demolished an M113A1 and killed its crew. While one battalion faced no RPG threat, the remaining units had 13 fired at their vehicles, of which four impacted, causing only light damage.

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## 2. (C) ORGANIZATION

### a. General

#### (1) Introduction

The organizational problems encountered in the mechanized infantry battalions are documented in this paragraph. Included are only those issues on which there was substantial agreement among commanders and others interviewed. There is a necessary correlation between organization and equipment. Where an organizational problem has an implied equipment impact, the latter is concurrently discussed. Quantitative equipment problems are discussed in paragraph 3, and the qualitative aspects of equipment are discussed in Annex N.

#### (2) Organizational Mix

(a) The organization of the mechanized infantry battalion is shown in Figure K-11. Seven of the eight battalion commanders were basically satisfied with the mix of elements in the battalion. Commanders indicated several minor areas where changes in quantity or additional capabilities were required.

(b) All commanders stated that the battalion headquarters could easily control additional maneuver companies. Three battalions had controlled as many as five companies. Seven commanders stated that a fourth mechanized rifle company would be highly desirable to provide additional maneuver strength. Only one commander felt that the battalion required an organic tank company or cavalry troop.

#### (3) The Army Authorization Document System (TAADS)

All commanders were queried as to their opinion concerning the adaptability of TAADS in stability operations. Only one commander was thoroughly familiar with the system. All commanders, based on their recent experiences in RVN with TOEs and MTOEs, felt the current system was cumbersome, unrealistic, and impractical.

### b. Battalion Headquarters

#### (1) Command and Control

##### (a) Helicopters

The mechanized infantry battalions had no organic helicopter assets. Commanders averaged approximately 2-1/2 hours daily for command, control, and reconnaissance. In all units, utility or cargo helicopter sorties were generally provided for logistical missions when

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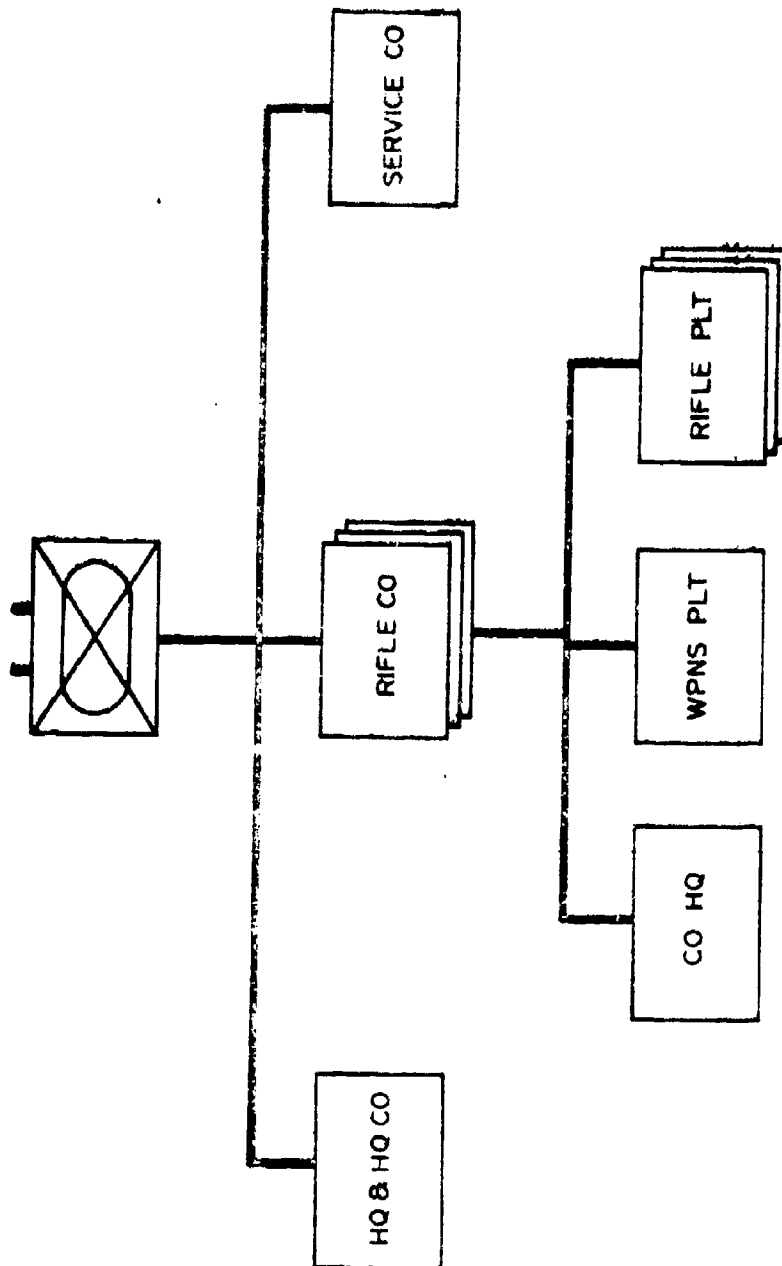


FIGURE K-11 (U). Organization of the Mechanized Infantry Battalion.

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ground resupply was not possible. Administrative requirements were fulfilled from allocated command and control time. If an element of the battalion made contact, a helicopter was generally made available. However, due to the short duration of most contacts, the action was often completed before the commander could arrive. Every commander but one, who had a fully dedicated command and control helicopter, considered the lack of adequate or responsive helicopter support his most significant command and control problem.

## (b) Command Vehicles

Four of the eight commanders had occasionally utilized their command M113A1 APC/ACAV, while the remaining four rarely used it. Commanders felt that if they accompanied one maneuver element, they tended to become isolated and reduced their ability to influence the action when another element of the battalion made contact. Commanders, therefore, relied on either helicopters or TOC communications for control.

(c) All commanders agreed that additional command communications were required. Heavy reliance on secure voice communications, in addition to traditional FM command nets, required more equipment than authorized. This problem was compounded during wide ranging, dispersed operations, and during dismounted operation.

## (2) Fire Support Coordination

Artillery liaison teams attached to battalions had to operate an FSCC responsible for coordinating all fires in the unit AO. In all but one battalion, the authorized communications equipment of the attached liaison team was not considered adequate. In these units, commanders had augmented the artillery liaison team with additional radios and, in those units that operated from a mobile field CP, with the S3 Air M577A1. Only in one battalion, which was organic to a mechanized brigade, was the artillery liaison team equipped with all the required equipment upon arrival.

## (3) Unit Location

The problems associated with unit location and various techniques developed to overcome them are discussed in detail in paragraph 2c(3), Annex G.

## (4) Staff Functioning

(a) Five of the eight mechanized infantry battalions operated with their staffs split between at least two, and sometimes four, separate locations. In all cases, this created staff coordination problems that were frequently compounded by inexperienced personnel.

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In only one battalion was the battalion executive officer used as staff supervisor and coordinator. In the other units, the XO was used as a deputy for administration and support, while the S3 functioned as a deputy for operations.

(b) In addition to the staffs operating from several locations, individual staff sections were also fragmented. This was most frequently the case of the S3 and S4 sections. Figure K-12 illustrates the dispersion of the unit staff and support elements during the evaluation. The operational and logistical staff sections of the mechanized battalions were overextended and frequently had to be augmented with personnel from other battalion elements. The requirement to maintain 24-hour operations in each location further aggravated the problem.

(c) Other than one battalion commander, who felt there should be no S5 at battalion level, the mechanized battalions made extensive use of the S5 section. In these seven units, the S5 was provided with sections ranging in size from three to 21 men. In addition to the increased S5 role discussed in paragraph 2c(4), Annex G, four battalions used the section extensively to gather local intelligence. Two commanders emphatically stated that their S5 was the single most important unit staff officer when operating in populated areas. In all units the S5 also handled claims and investigations resulting from combat operations. Figure K-13 shows equipment and personnel provided to the S5 in each unit at the time of the evaluation.

## (5) Dispersion and Rear Area Requirements

(a) Each battalion operated under a different set of factors dictated by the missions assigned and its respective location. Figure K-12 showed the dispersion of personnel and equipment. This dispersion created multiple security requirements which had to be met from organic assets, which proportionately reduced the field strength of all combat elements. This contributed to organizational problems.

(b) Mechanized infantry battalions averaged approximately 10 percent of their assigned strength committed to rear area or base camp static security. The percentages ranged from 3 to 30 percent. Several commanders suggested that a 30- to 50-man base security platoon composed of profile personnel be authorized, to minimize static security requirements.

(c) In addition to these security requirements, one battalion was responsible for staffing and operating all service facilities at its rear area, including the PX, snack bar, civilian personnel office, and other functions normally associated with a brigade or division headquarters.





HEADQUARTERS	UNIT	DRIVER	CLERK	VEHICLE	WEAPONS	RADIOS	KCS and INTERPRETERS	OTHER
1st Rde, 5th Inf Div	1/62	1	2	3/4T	M60 MG	AN/VRC-47 w/secure	2	Billhorn
2nd Rde, 5th Inf Div	1/62	1	1	1/4T		AN/VRC-46	1	
3rd Rde, 5th Inf Div	1/62	1	1	1/4T	M60 MG	AN/VRC-46	1	Billhorn
4th Rde, 5th Inf Div	1/62	1	1	3/4T	M60 MG	AN/VRC-46	1	Billhorn
5th Rde, 5th Inf Div	1/5	1		1/4T				
6th Rde, 5th Inf Div	1/60		2	3/4T 1/4T	2 M60 MG	AN/VRC-46 2 AN/VRC-47	3	Loudspeaker set
7th Rde, 5th Inf Div	1/60	1	1	3/4T 1/4T	2 M60 MG	2 AN/VRC-46 1 AN/PRC-25		US Inf Squad, Loudspeaker set, (3) 1/4T w/M60, (2) AN/VRC-46, AN/PRC-25
8th Rde, 5th Inf Div	1/67		2	3/4T 1/4T	2 M60 MG	AN/VRC-46 AN/VRC-47 AN/PRC-25	6	1 Officer Asst. SS, Loudspeaker set

FIGURE K-13 (U). Personnel and Equipment Provided to the S5 in the Mechanized Infantry Battalions.

# CONFIDENTIAL

## (6) Liaison

(a) Liaison requirements in the mechanized battalions varied considerably from unit to unit, and, frequently within a unit, depending upon the mission and the AO assigned. Liaison requirements paralleled those discussed in paragraph 2b(6), Annex J. Where the brigade or controlling headquarters performed liaison with local GVN agencies, commanders were generally satisfied with authorizations. Three commanders felt that their sections were not adequate to meet all requirements.

## c. Combat Support and Combat Service Support Elements

### (1) General

#### (a) MTOE Organization

Under the MTOE, combat support elements were located in HHC and service support elements were located in Company D (Figure K-14 and Figure K-15, respectively). This organization differs from the original G-series TOE, in which all of these elements were located in HHC. Although this MTOE reorganization was not specifically recommended by the MACOV study, as it was for the tank battalion reorganization, the rationale was the same as discussed in paragraph 2c(1), Annex J.

#### (b) Organizational Problems

Each battalion commander, executive officer, and HHC and Company D commander was interviewed concerning the effectiveness of the MTOE organization of combat support and combat service support elements. All those interviewed, as with those in the tank battalion, felt that the organization was unsatisfactory and created a duplication of command responsibility between the HHC and Company D commanders. Only in the two battalions of the 1st Infantry Division did the Company D Commander function in his intended role as the primary logistical operator of the battalion. However, even in these units, there were many areas of duplication of effort between the Company D commander and the battalion S4. In the remaining battalions, the Company D commander had little control over the combat service support elements; he operated as a company administrator and in some cases as an FSB/base camp coordinator. It was unanimously recommended that HHC be reorganized as a headquarters/service support company and company D as a combat support company similar to those recommended for the tank battalion.

## (2) Headquarters and Headquarters Company

### (a) Company Headquarters

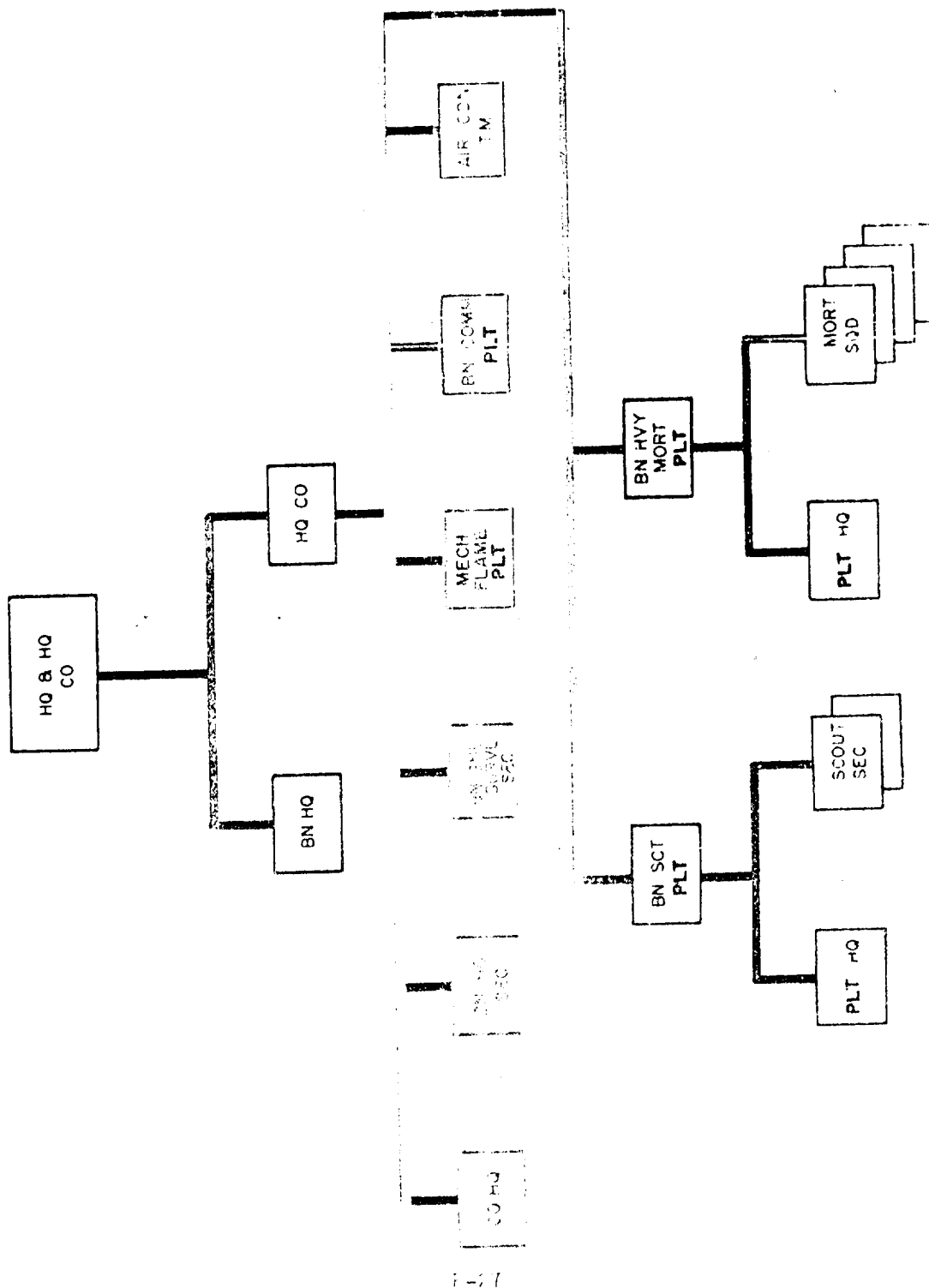
#### 1. Command and Control

The roles and duties of the HHC commanders in the eight mechanized infantry battalions varied considerably as a result of

K-26

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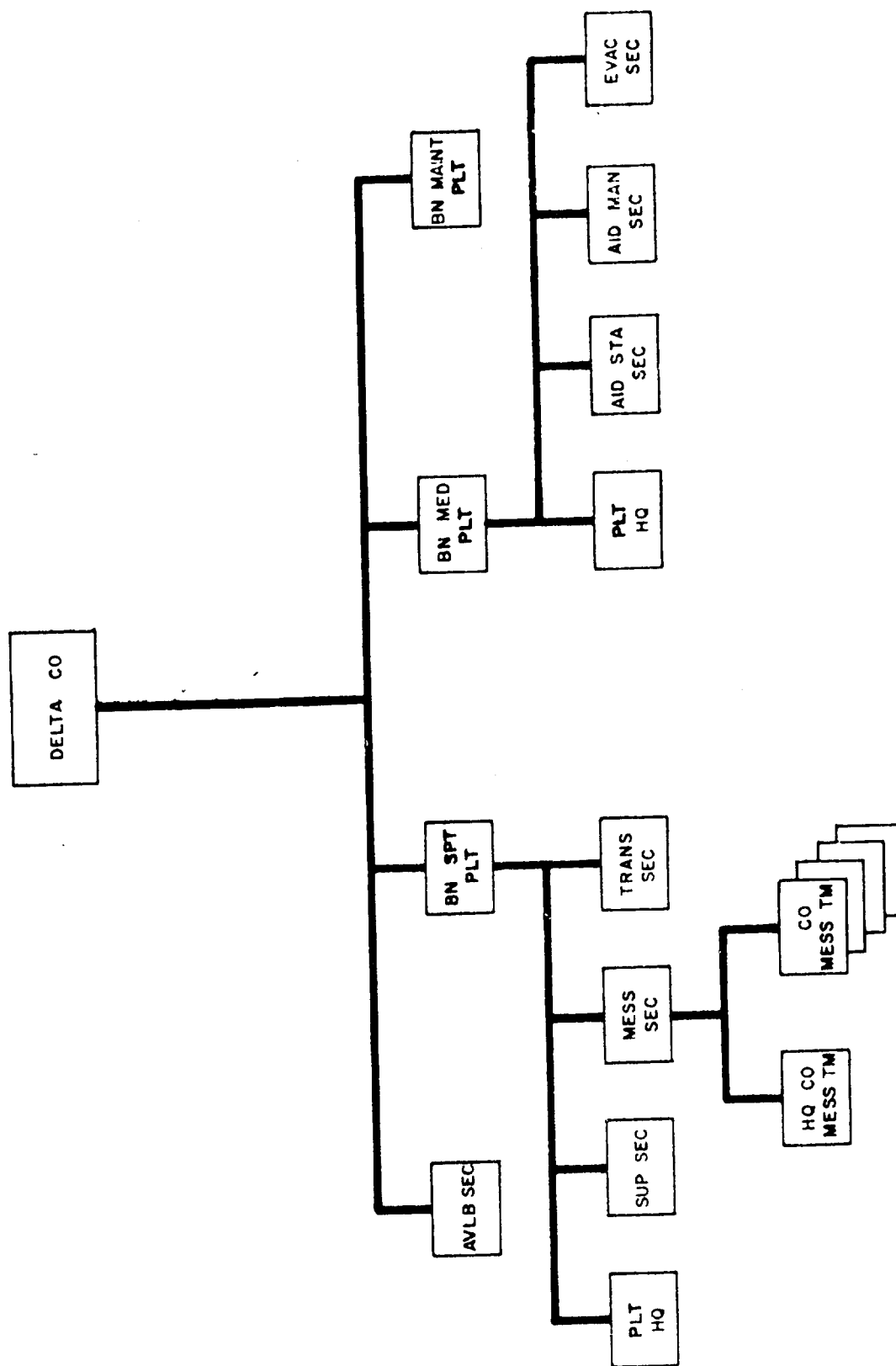


FIGURE 7-15 (U). NTOE Organization of Service Company, Mechanized Infantry Battalion.

# CONFIDENTIAL

local task organization, CP location, and headquarters dispersion. In the two battalions of the 1st Infantry Division, the commander functioned primarily as the tactical command post coordinator. In this role, he was responsible for CP security, resupply, CP organization, and details. Most administration was conducted by the HHC executive officer or first sergeant, who were located at either the FSB or base camp. Neither of these commanders was responsible for the tactical employment of combat support elements, each operated from the S1/S4 M577A1 command post vehicle. They both stated that their duties could be performed more efficiently if the company headquarters were provided its own M577A1. The authorized command vehicle, a 3/4-ton truck, lacked the needed size and mobility. In the remaining six battalions, the HHC commanders functioned primarily as headquarters commandants. In this role, they were responsible for administration of HHC, supervision of base camp/FSB details, and security. None of these commanders was responsible for the tactical employment of the combat support elements. In four of these companies the authorized executive officer was not assigned and the commanders felt that none was needed under existing conditions. None of these commanders felt that an M577A1 command post vehicle was needed.

## 2. Maintenance

Maintenance on the company's vehicles, under the G-series TOE, was performed by the battalion maintenance platoon. With the battalion reorganization, however, that platoon was transferred to Company D. To fill this void, the MTOE added 12 maintenance personnel to the company headquarters. The MTOE did not authorize the company an automotive maintenance shop equipment set (Number 1 Common) or a recovery vehicle as in the rifle companies.

### (b) Combat Support Elements

The combat support elements assumed an increasingly important combat, security, and special operations role in RVN. With the mechanized rifle companies widely dispersed and fully committed to reconnaissance, security, and night operations, commanders retained little tactical flexibility. As a result, the combat support elements became an important tool with which to influence the action. Under the MTOE, all combat support elements were assigned to HHC.

#### 1. Battalion Scout Platoon

a. All eight commanders considered the scout platoon primarily a light offensive combat element rather than a reconnaissance unit. Contrary to the scout employment in the tank battalions, the scout platoons in the mechanized infantry battalions specialized in mounted combat. Specific techniques of employment and missions assigned varied considerably from unit to unit, as shown in Figure K-16.

K-20

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EMPLOYED BY		TYPES OF MISSIONS ASSIGNED TO BN SCOUT PLATOON																
HQ	UNIT	PLATOON	SECTION (2)	CP SECURITY	ROAD CLEARING	ROAD SECURITY	CONVOY ESCORT	SHOW OF FORCE	SCREENING	REINFORCE INF	RPF	MOUNTED RECON	LIGHT COMPANY	AMBUSH PATROLS	CIVIC ACTION	OPCON TO GVN	COMBINED OPS	SPECIAL OPS
1 BDE 5 INF DIV	1/61	100%		X	X	X					X	X	X			X		
TF 50 TH	1/50	25%	75%	X	X	X				X	X		X		X	X		
1 ST INF DIV	1/16		100%	X	X	X	X	X	X	X	X		X				X	
	2/2		100%	X	X	X		X	X	X	X		X				X	
25 TH	1/5	25%	75%	X		X		X	X	X	X	X	X				X	
INF	2/22	50%	50%	X			X			X	X	X	X	X	X	X		
DIV	4/23		100%	X	X	X	X			X	X		X	X	X	X	X	
3 BDE 9 INF DIV	2/47	50%	50%	X							X	X	X		X	X	X	

FIGURE 4-10 (a) Scout Platoon Employment, Mechanized Infantry Battalion

## CONFIDENTIAL

b. Most commanders considered the scouts an elite element and used them for specialized operations. Generally, the scout platoons were split and employed by sections as independent maneuver elements. However, every unit occasionally combined the scout flame platoons to form a larger economy-of-force unit. In four battalions, the platoon was placed under the nominal operational control of local GVN officials for use with RF units. Even though the scouts concentrated on mounted combat, they frequently were employed on dismounted night ambush patrols.

c. Seven battalions had augmented the scout platoon armament to provide more firepower for independent missions. All commanders expressed a requirement for automatic grenade launchers and for a change in the authorized M113A1 APC/ACAV machinegun mix.

d. Two commanders expressed a desire to have the MTOE-deleted battalion antitank platoon reinstated and reequipped with three M551 AR/AAVs to be employed with the scout platoon. Two other commanders stated that the scout platoon required organic 81mm mortars for fire support and illumination. One commander routinely attached a mortar to each scout section, because it frequently operated outside supporting artillery fires.

e. All commanders considered authorizations for command vehicle and portable radios in the scout platoon inadequate, as discussed in paragraph 3i(2), below.

### 2. Battalion Heavy Mortar Platoon

a. All commanders were satisfied with the firepower and illumination provided by the battalion heavy mortar platoon's four 4.2-inch mortars. As in the tank battalions, 4.2-inch mortar fire was integrated into the artillery fire plan. Only one battalion was able to fire the 4.2-inch mortar without obtaining clearances from higher headquarters.

b. In five battalions, the platoon was always employed intact, usually centrally located in the AO to provide general support. In the other battalions, the platoon was normally split into sections, with one platoon frequently splitting down into individual squads. Local security requirements and available artillery support were the criteria which determined splitting the platoon.

c. None of the commanders expressed a desire to exchange the 4.2-inch mortars for 81mm mortars. While commanders felt that addition of an 81mm mortar section would enhance the platoon's close-in fire capability, they did not consider it essential.

K-31

## CONFIDENTIAL

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d. No unit had fire direction problems other than those attributed to personnel shortages. In most battalions, the FO teams were used to augment the mortar crews and the FDC, as explained in paragraph 2b(2), Annex J. FDC communications requirements also paralleled those found in the tank battalions.

e. With the wide dispersion of combat elements, the mortar platoon was frequently required to provide or to assist in providing local security.

f. Provision for on-vehicle stowage of ammunition was considered inadequate. As a result nearly all M106A1 mortar carriers were overloaded, carrying an average of 113 4.2-inch rounds in addition to 9000 rounds of machinegun ammunition. Overloading contributed to breakage of torsion bars and at times created trafficability problems due to increased ground pressure. Two battalions attached an M548 from the battalion support platoon to the mortar platoon to carry additional ammunition. Two other units obtained ammunition trailers, which were towed by an M106A1 or the FDC M577A1. This was considered impractical, since it delayed fire missions called for during movement.

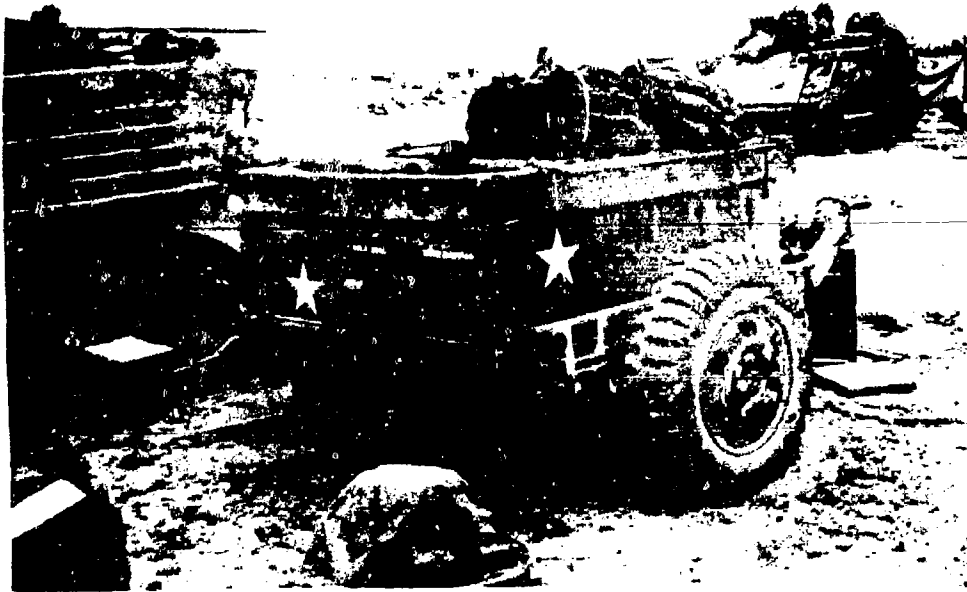


FIGURE K-17 (U). Heavy Mortar Platoon Ammunition Trailer.

K-32

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## 3. Mechanized Flame Platoon

a. The MTOE added to each battalion a mechanized flame platoon consisting of four M132A1 mechanized flamethrowers and two XM45E1 track-mounted flame service units. The equipment on hand varied considerably from unit to unit, and several units had the M4A2 truck-mounted flame service unit issued in lieu of the XM45E1 as shown in Figure K-18. The biggest problem with the flame platoon was the inability of the M4A2 to accompany the M132A1 cross-country.

HQ	UNIT	M132A1		XM45E1		M4A2	
		Auth	O/H	Auth	O/H	Auth	O/H
1st Bde 6th Inf Div	1/61	4	4	2	2	0	0
TF South	1/50	4	2	2	1	0	1
1st Inf Div	1/10	4	4	2	2	0	0
	2/2	4	2	2	1	0	1
25th Inf Div	1/5	4	4	2	2	0	0
	2/22	4	4	2	1	0	1
	4/23	4	3	2	1	0	1
3d Bde 9th Inf Div	2/47	4	3	2	0	0	2

FIGURE K-19 (U). Flame Equipment Authorized and On Hand in Mechanized Infantry Battalions.

b. The flame platoon was employed in one of three ways: in general support of the battalion; by section in direct support of a company (each section consisting of two M132A1's and one service unit); or attached to a section of scouts for a specific mission.

c. The two battalions faced with a significant boobytrap threat relied heavily on the flame platoon to burn boobytrapped areas. Other frequent uses were to clear fields of fire, to assist in land clearing operations, to burn vegetation and bunkers in enemy base camps, and for psychological effect in encouraging surrender. Every commander considered the flame platoon a tremendous asset, and most asked for additional

K-13

# CONFIDENTIAL

## CONFIDENTIAL

equipment. This included two additional M132A1's and one additional XM45E1. All commanders emphasized the necessity for tracked service units to optimize flame platoon employment.

### 4. Bridge Section

a. Although no bridging was authorized in the mechanized infantry battalion, four battalions had bridge sections, each equipped with two M113A1 marginal terrain assault bridges (MTAB) (FNSURE #84). Generally, the bridge section was combined with the flame or scout platoon for control.

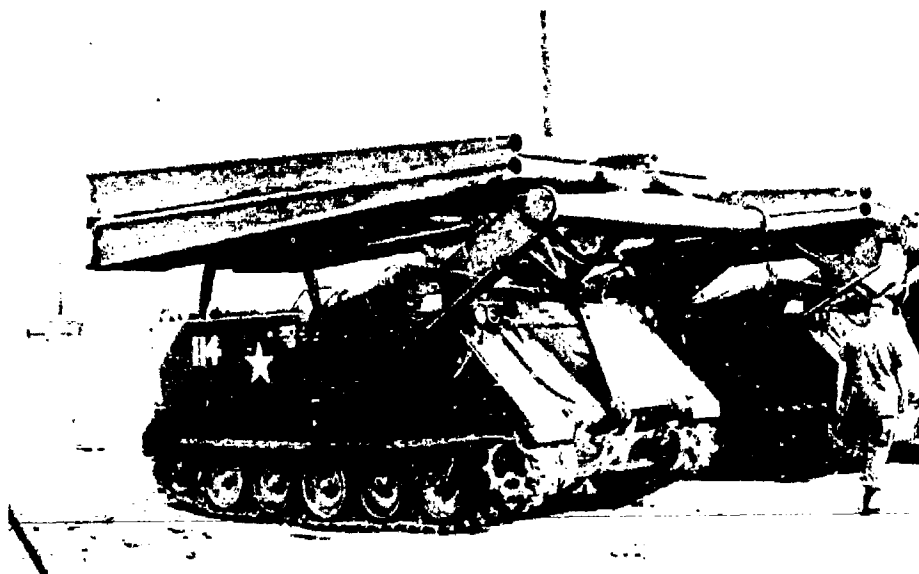


FIGURE K-19 (U). The Marginal Terrain Assault Bridge.

b. Five of the eight commanders expressed a definite need for bridging. The other three stated they had no requirement in their AO, but might if employed elsewhere. The average desired BOI was two bridges and launchers per battalion.

c. The one battalion in the northern Delta region had an urgent bridging requirement and had used their bridge section more than any other unit. However, due to maintenance difficulties with the MTABs, they had been required to use other bridging expedients. This unit requested a bridge per line company as well as a section in HHC.

K-34

## CONFIDENTIAL

# CONFIDENTIAL

d. During the dry season the MTABs were used primarily for obstacles such as ditches. All commanders stated they had been used regularly during the rainy season. They also stated that the bridge authorized must be capable of supporting all vehicles in the battalion, including the M578 recovery vehicle, and should possess cross-country mobility equal to that of the M113A1 APC/ACAV.

## 5. Battalion Ground Surveillance Section

a. The MPOE reduced the ground surveillance section to two radar teams, each consisting of three radar operators, one AN/PPS-5 radar, and one 1/4-ton truck with trailer. The radars on hand in the mechanized battalions during the evaluation are shown in Figure K-20. AN/PPS-4 radars had been issued to five units in lieu of the AN/PPS-5.

HQ	UNIT	PPS-5		PPS-4	
		AUTH	O/H	AUTH	O/H
1 BDE	1/61	2	2	0	1
5 INF DIV (M)					
TF SOUTH	1/50	2	0	0	2
1 INF DIV	1/16	2	0	0	0
	2/2	2	0	0	0
25 TH INF DIV	1/5	2	1	0	3
	2/22	2	1	0	1
	4/23	2	1	0	2
3 BDE	2/47	2	2	0	0
9 INF DIV					

FIGURE K-20 (U). Radars Authorized and On Hand in Mechanized Infantry Battalions.

b. In one division, all ground surveillance radars had been consolidated in division artillery, who manned, employed, secured, and maintained them. In another division, two brigades had assumed control over employment, while requiring the battalions to man, maintain, and secure the sets. In these units, command policy precluded movement of radars by ground vehicle. Employment of radars in the battalions is shown in Figure K-21.

K-35

# CONFIDENTIAL

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HQ	UNIT	APPROXIMATE EMPLOYMENT LOCATIONS			HQ CONTROLLING EMPLOYMENT & SUPPORT	
		BASE CAMP	OUTPOSTS & FSB	NDP & AP'S	HIGHER HQ'S	BATTALION
1 BDE 5 INF DIV	1/61	25%	75%			X
TF SOUTH	1/50		63%	37%		X
1 INF DIV	1/16	N/A	N/A	N/A	X	
	2/2	N/A	N/A	N/A	X	
25 TH INF DIV	1/5	12%	58%	30%		X
	2/22		78%	22%	X	
	4/23		86%	14%	X	
3 BDE 9 INF DIV	2/47	13%	77%	10%		X

FIGURE K-21 (U). Control of Employment of Radars in Mechanized Infantry Battalions.

c. In the battalions that retained control over their radars, two had significant maintenance and operator training problems. The other two units employed their radar doctrinally in support of the maneuver units, averaging about 90 percent utilization.

d. No commander felt an M113A1 should be provided each radar team as in the other types of armored units, since the radar sets were considered too fragile for cross-country movement by tracked vehicle. Two units had transported radars with tracked vehicles with some success, but emphasized that special precautions were required. One unit used a hammock hung inside an M113A1, while another used foam rubber mattresses and pillows to insulate the equipment from shocks during movement.

e. Six commanders were satisfied with the authorized BOI, while two expressed a requirement for five radars per battalion. All commanders desired a radar capability at battalion level, but most considered current equipment inadequate to fulfill their requirements.

## 6. Air Control Team

The air control team as authorized by MTOE was not used in its intended role in any unit. Personnel were generally absorbed into the S2/S3 sections.

K-36

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## 7. Extra Combat Formations

a. Three battalions had organized extra combat formations for special missions. In one unit, this consisted of volunteer clerks, cooks, mechanics, women, radio operators, and other miscellaneous personnel. The unit specialized in mobile night ambush patrols either on foot or mounted in gun-jeeps.

b. Two battalions employed what had once been called the combined reconnaissance and intelligence platoon (CRIP). The CRIP had been officially disbanded; however, both units retained this organization under a different name. It consisted of 15-20 infantrymen taken from line company assets. In one battalion, they were under the S5, who utilized them, in close coordination with local GVN officials, to gather intelligence and to support VC elimination operations. This commander considered his CRIP extremely valuable, and most of his combat operations were based on intelligence gathered by the platoon. The other battalion used the platoon for long-range reconnaissance and ambush operations.

c. Five battalions had organized base defense platoons to provide rear area or FSR security. Personnel and equipment for these platoons were taken from battalion assets. Generally, this security unit was composed of 20-40 EV committed full time to bunker guard, observation posts, or other static defense tasks.

### (3) Service Company (Company D)

#### (a) Command and Control

Only two Company D commanders functioned as logistical operators. In the remaining battalions they were primarily concerned with company administration, base camp, mess, and security functions. As mentioned in paragraph 2c(1), above, all persons interviewed felt that the Company D commander's duties paralleled those of the headquarters commandant. No commander felt that the service company needed a tracked CP vehicle.

#### (b) Maintenance Section

Company D was not authorized a maintenance section as was the service company of the tank battalion. Most personnel interviewed stated that a maintenance section was not required.

# CONFIDENTIAL

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## (c) Support Platoon

### 1. Organization

#### a. General

Personnel interviewed felt that the support platoon organization was adequate to support operations except for those areas indicated below.

#### b. Supply Section

The authorized supply section, consisted of seven personnel. In all units, property book officers and S4's expressed a requirement for at least two additional personnel in this section. The justification for this expressed requirement was that the section was required to operate and to maintain issuing facilities for TA50-901 and other equipment.

#### c. Transportation Section

Personnel interviewed stated that the authorized grades for enlisted supervisory personnel (one staff sergeant, E6, and two sergeants, E5) were inadequate. All commanders felt that each of these authorizations should be elevated one grade. The reasons are as stated in paragraph 2c(3), Annex J. As in the tank battalion, it was felt that the section needed at least four portable radios for use with helipad operations and on supply vehicles. Some personnel also stated a need for an assistant driver for each section vehicle.

### 2. Resupply Operations

#### a. General

Figure K-22 shows where each battalion drew the various classes of supply, the distance from that location to the battalion forward logistics base, and the means of transport used. Only one unit (2/2 Infantry) utilized helicopters in this process. This was because of insecure lines of communication and a high mine threat. One unit (1/50 Infantry) was dependent on a logistics support activity (LSA) from the Cam Ranh Bay Army Depot for all its supplies. The LSA, located at the battalion base camp, received all its supplies by boat or by Air Force fixed-wing aircraft. This resulted in a very slow reaction time and necessitated continuous detailed coordination between the battalion and the LSA. From the forward logistics base, three units conducted more than 75 percent of their resupply to combat elements by air, while the other battalions conducted over 75 percent by ground. Ground resupply was accomplished by the M548 tracked cargo carrier or by having the companies return to the base.

K-38

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CTZ		I CTZ	II CTZ	III CTZ					
PARENT UNIT		1ST BDE 5TH MECH DIV	TF SOUTH	1ST INFANTRY DIVISION		25TH INFANTRY DIVISION		3D BDE 4TH, 1ST DIV	
REFUGEE	UNIT LOCATION	1/61	1/50	2/2	1/16	1/5	2/22	4/23	2/47
	SUPPLIES	DA PANG	CM RANH UNIT EX- PEDITER AT DEPOT	LONG BINH	LONG BINH	LONG BINH	LONG BINH	LONG BINH	LONG BINH
MEANS/DIS- TANCE TO LOG BASE		NONE		NONE	NONE	NONE	NONE	NONE	IV, V, VII
	DIVISION BASE	N/A	SEA/AIR	N/A	N/A	N/A	N/A	N/A	GROUND 70 KM
MEANS/DIS- TANCE TO LOG BASE	LOCATION	N/A	N/A	LAI KHE	LAI KHE	CU CHI	CU CHI	CU CHI	N/A
	SUPPLIES	N/A	N/A	II, VII, VIII	II, VII, VIII	II, VII, VIII	ALL, WATER	VII, VIII	N/A
MEANS/DIS- TANCE TO LOG BASE		N/A	N/A	GROUND 40 KM	GROUND 80 KM	GROUND 40 KM	CP COLLOCATED	GROUND 50 KM	N/A
	DE/BN BASE	QUANG TRI	PHAN THIET	DAU TIENG	BEAP CAT	DAU TIENG	N/A	TAY NINH	TAN AN
MEANS/DIS- TANCE TO BN FSB	LOCATION	I, II, IV, V, VII, IX WATER	ALL, WATER	I, III, IV, V, IX	I, IV, V, IX	I, III, IV, V, IX, WATER	N/A	I, II, III, IV, V, IX	I, II, III, VIII, IX
	SUPPLIES	GROUND 25 KM	CP COLLOCATED	AIR 20 KM	GROUND 25 KM	CP COLLOCATED	N/A	GROUND 12 KM	GROUND 10 KM
FSR	LOCATION	C-2	N/A	FSB IRON WATER	FSB DAKOTA III, WATER	N/A	N/A	FSB RAWLINS	BIEN PHUOC
	SUPPLIES	III, WATER	N/A			N/A	N/A	WATER	WATER

FIGURE K-22 (U). Resupply Operations, Mechanized Infantry Battalions.

## CONFIDENTIAL

### b. Class III

The nature of operations and the limited amount of authorized POL handling equipment caused the resupply of Class III to be a continuous problem. Three battalions resupplied POL to forward elements by air using collapsible 500-gallon drums. Problems encountered are discussed in paragraph 2d(3), Annex G. One battalion had the companies return to the logistical base on a daily basis for refueling. The remaining battalions mounted tank and pump units or collapsible drums on M548's (Figure K-23) and, as required, they sent these vehicles to the companies. In some cases, the M548's accompanied elements in the field. POL handling equipment is discussed in paragraph 31(4), below.

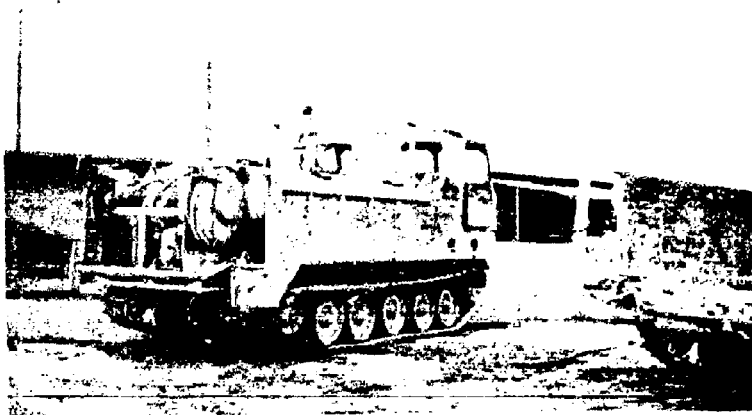


FIGURE K-23 (U). Tank and Pump Unit Mounted on M548 Tracked Cargo Carrier.

### c. Class V

Three battalions maintained a complete unit basic load of Class V in their PSBs. All units maintained a capability to deliver ammunition to combat elements on an emergency basis, by air or ground.

### d. Water

Water resupply was a problem in all mechanized infantry battalions, as discussed in paragraph 3d(6), below.

K-4

CONFIDENTIAL



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## (d) Maintenance Platoon

### 1. Organization

In general, personnel interviewed felt that the maintenance platoon organization was adequate to support battalion operations. However, several personnel felt the four authorized recovery mechanics were not sufficient to operate the platoon's two M578 LTR's and M543 wrecker. They recommended that three additional recovery mechanics be added. They were satisfied with personnel authorizations, but, as in the ACR, all felt replacement mechanics were not adequately trained. In all mechanized infantry battalions, there was a shortage of maintenance NCOs, which degraded the efficiency of unit-level maintenance.

### 2. Maintenance Operations

#### a. Dispersion

Seven of the eight battalions had consolidated their maintenance platoon in one location. This was either at the brigade base camp or FSB. The remaining battalion had parts of its maintenance platoon at both locations.

#### b. Recovery

The maintenance platoon normally did not employ its recovery vehicles outside the unit motor pool. Exceptions to this occurred only when a vehicle assigned to BHC or Company D needed recovery or when the recovery vehicle of a rifle company was inoperable. One battalion, which operated in extreme southern III CTZ, assigned an M548 to its maintenance platoon. It became the primary recovery vehicle, because its greater mobility allowed it to traverse terrain where the M578 would have become mired.

#### c. Periodic Services

The performance of quarterly services on tracked vehicles was affected by operational requirements. In three battalions, these services were routinely performed. In the remaining battalions, they were either conducted in a perfunctory manner or not conducted at all. Many commanders stated that their missions precluded these services. Maintenance personnel felt that the lack of these services resulted in increased downtime for combat vehicles.

#### d. Prescribed Load List (PLL)

In four battalions, PLLs were consolidated at battalion level. Additional personnel were assigned to the maintenance platoon to maintain the PLL. In the four other battalions, PLLs remained

K-41

CONFIDENTIAL

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in NHC and the rifle companies. The maintenance platoon administered the PLL for Company D. The average zero balance for the battalions at the time of the evaluation was 48 percent. In all units, serviceable parts on battle-loss and overage vehicles were frequently used to replace unserviceable parts of other vehicles.

### e. Shop Facilities

Most personnel interviewed stated that a steam Jenny was required to increase the efficiency of maintenance operations.

### f. Direct Support (DS) Maintenance

Six battalions had a DS maintenance contact team with the battalion maintenance platoon or the maintenance platoon was collocated with the DS unit. In these battalions, most DS-level maintenance was performed by the unit itself. In both these units, the maintenance platoon maintained several non-PLL-authorized engines and transmissions on hand for immediate replacement. All unit commanders felt that the availability of float equipment in the DS units was unsatisfactory. Several battalions experienced problems with the DS support elements taking excessive time in retrograding battle-loss or inoperable vehicles.

### (e) Medical Platoon

#### 1. Organization

There were only minor variations from MTOE organization in the medical platoons of the mechanized infantry battalions. One battalion had a surgeon only on a part-time basis. All commanders stated they needed a full-time surgeon for both organic medical and civic action duties.

#### 2. Medical Operations

##### a. Company Aidmen

Normally there were four company aidmen attached to each rifle company. For the same reasons stated for the tank battalion [see paragraph 2c(3), Annex J], surgeons, medical service officers, and medical platoon sergeants considered that the senior company aidmen should possess MOS 91C instead of MOS 91B.

##### b. Medical Evacuation

Normally there was one M113A1 medical evacuation vehicle attached to each rifle company. While almost all medical evacuation was by air, most personnel felt a valid requirement existed

K-42

CONFIDENTIAL

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to retain the platoon's ground evacuation capability to support the battalion's dispersed tactical operations. In two battalions, the M113A1's remained in the base camp and were only occasionally used for civic action projects. In the other battalions, the M113A1's were used in their intended role when required. When not required, they were employed either to supplement the rifle company's command post or as an added fighting vehicle. It was also felt by most personnel that, in order to provide a self protection capability, the M113A1's needed the Armament Subsystem "A".

## c. Aid Station

Five battalions operated aid stations in two locations and three battalions at one location. When two aid stations were established, personnel and equipment came from authorized assets. This created no apparent problems.

## (f) Communications Platoon

### 1. Organization

In general, the personnel interviewed stated that the communications platoon was authorized sufficient personnel to support battalion operations. However, personnel and equipment authorized the platoon were frequently used other than as intended by MTOF.

### 2. Operations

The communications platoon in the mechanized battalions performed three separate services: it provided and/or obtained responsive communications maintenance for the battalion; it operated the battalion RTT in either the brigade or division RTT net; and it operated the battalion message center and switchboard.

#### a. Communications Maintenance

Every communications platoon performed some higher level repairs, with organic personnel, using unauthorized test equipment and repair parts. The vast majority of organizational maintenance was performed by the communications platoon. The average downtime per item of equipment was less than 24 hours at the organizational level and 4-7 days at the DS level. However, one battalion averaged up to 30 days for DS repair. Most commanders stated that additional test equipment was required to facilitate responsive communications maintenance. This should include some means of testing secure equipment.

#### b. Wire Communications

Wire communications were little used, as indicated in paragraph 3c(1)(d)3., Annex B.

K-43

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## c. Personnel

The comments in paragraph 2c(3), Annex J, also apply here, concerning the use of motor messengers and the desire of communications personnel to trade messengers for radio repairmen.

## d. Mechanized Rifle Company

### (1) Organization and Operations

(a) The only significant MTOE change to the mechanized rifle company was the deletion of the antitank section of the weapons platoon. The company was used as the basic maneuver and control element in all battalions. In five units, companies operated for extended periods from mobile NDPs. They returned to a FSB or base camp every 4-6 weeks for a 3-day maintenance standdown. In the other battalions, some companies operated from field NDPs and some from more permanent FSBs.

(b) All mechanized infantry companies maintained rear detachments with an average of 7 percent of their personnel at either a battalion FSB or brigade base camp. In three battalions, each company was tasked for an additional 4-6 percent of its strength for the battalion rear area security force. The remainder of the rifle company personnel were located either in the field or at a FSB. Companies had attached an artillery FO team, aidmen, two to six Kit Carson Scouts (KCS), and in most cases, an interpreter. Two battalions attached an M548 to each company to carry ammunition and general cargo.

### (2) Command and Control

(a) Commanders at all levels stated that the radios authorized for the command M113A1 APC/ACAVs were inadequate for command and control. A commander employing only authorized radios was unable to operate in two nets simultaneously. This problem is discussed in detail in paragraph 31(2), Annex G.

(b) Commanders in seven of the eight battalions stated that the second M113A1 authorized for the rifle company headquarters, and manned by communications personnel, was adequate as a CI vehicle and that an M77A1 was not needed. All companies had provided this M113A1 with additional radios in order for it to serve as the company NCS.

(c) The artillery FO rode on the company commander's vehicle. In every unit, the radio authorized the FO (AN/PRC-25) was considered inadequate because of its limited range. An additional AN/VRC-46 had been mounted in each command vehicle for the FO's use.

K-LL

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(d) The company CP group usually consisted of the command, communications, maintenance, and medical M113A1's. When the commander accompanied a platoon, he took only his command vehicle.

### (3) Mechanized Rifle Platoon

#### (a) Platoon Operations

The rifle platoon was the smallest element used for independent operations. While most units were satisfied with the four carriers authorized each platoon, two units modified this organization. One battalion employed only three M113A1's per line platoon. The other battalion employed five tracks to provide the platoon staying power to continue the mission if one vehicle became inoperable.

(b) Most rifle platoons operated below their authorized strength of 44 EM. Company commanders and platoon leaders stated, however, that there was insufficient room on the top of the M113A1 for the authorized 11-man squad if they had been available (see Figure K-24). The average strength of the rifle platoons during the evaluation is shown in Figure K-25.

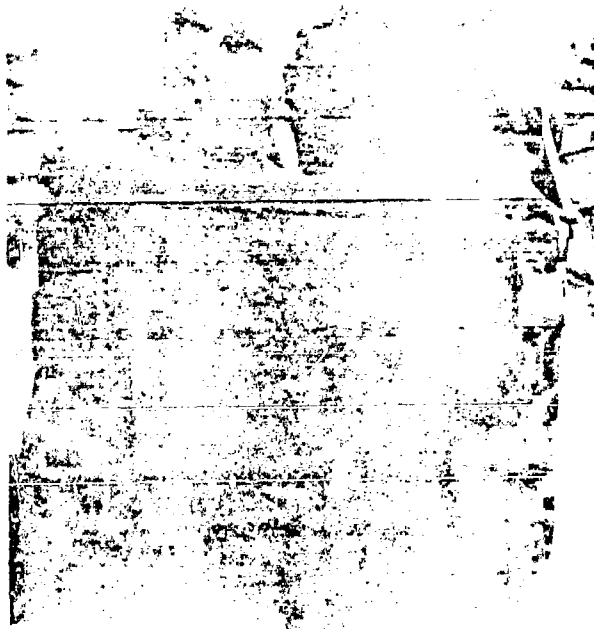


FIGURE K-24 (U). Mechanized Rifle Squad.

K-45

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		PLATOON STRENGTH				SQUAD	
		A S S I G N E D	P R E S E N T	F O R D U N T Y	D I S M O U N T E D	P R E S E N T Y	F O R D U N T Y
HQ	UNIT	(1)				(2)	
1st Bde 5th Inf (M)	1/61	36	28	20	7		
TF South	1/50	35	26	20	7		
1st Inf Div	1/16	30	25	17	6		
	2/2	38	31	23	7		
25th Inf Div	1/5	32	26	18	6		
	2/22	32	24	18	6		
	4/23	32	28	20	6		
3d Bde 9th Inf	2/47	33	27	22	7		

NOTES: (1) Rifle Platoon Authorized Strength - 44.  
 (2) Rifle Squad Authorized Strength - 11.

FIGURE K-25 (C). Average Strength of Mechanized Rifle Platoons and Squads During the Evaluation (U).

In addition, rifle platoons in most battalions had at least one KCS, an aidman, and often a sniper, attached.

## (c) Platoon Organization

No platoon employed the weapons squad in its intended role. Rather, all four squads were used interchangeably as rifle squads. With the weapons available on the M113A1 APC/ACAVs to support dismounted infantry, no commander indicated a requirement to retain the weapons squad as a separate identifiable entity. All considered four rifle squads a more practical organization for RVN operations.

K-46

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FIGURE K-26 (U). M113A1 APC/ACAV Supporting Dismounted Infantrymen.

### (d) Platoon Command and Control

1. Commanders and platoon leaders in every unit considered the authorization for AN/PRC-25/77 radios inadequate to support dismounted operations and squad-size ambushes. Also, the authorized squad radio (AN/PRC-98) was considered unreliable and of too limited a range. It was used by only two battalions. This problem is discussed in paragraph 3i(2), below.

2. As shown in Figure K-25, platoons did not operate with 11-man rifle squads. As a result, the fire team ceased to exist as a maneuver element within the squad. Most units had no assigned fire team leaders. Squad size ambushes were frequently formed with two squads, due to personnel shortages.

### (4) Weapons Platoon (Mortar Platoon)

(a) The weapons platoon antitank section was deleted by MTOE. As a result, the weapons platoon functioned as a mortar platoon. The platoon leader and platoon sergeant normally rode on the mortar FDC track, which served also as the platoon's command vehicle. All companies

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relied heavily on their three 81mm mortars for fire support and illumination of company and platoon NDPs and night ambushes. Company mortars were used an average of 76 percent of the days in the evaluation period.

(b) In six battalions, the infantry companies always employed their mortars as a platoon. In one battalion, one mortar was split from the platoon 15 percent of the time, and in another battalion individual tubes were assigned to the rifle platoons approximately 60 percent of the time. Only one commander felt the company required a fourth mortar to facilitate employment of the mortars by sections in two locations.

(c) In four battalions, unauthorized ammunition trailers or M548's were used to carry additional ammunition. In three battalions, either an M548 or a trailer was used to carry the third 81mm mortar in each company, since the companies were short M125A1 carriers. One battalion, which was short M125A1's, had only two 81mm mortars in the field with each company. All M125A1's were overloaded, carrying an average load of 179 rounds of 81mm ammunition, 5000 rounds of caliber .50 machinegun, 5000 rounds of 7.62mm machinegun, and 3000 rounds of 5.56mm rifle ammunition.

(d) Normally, the mortar platoon remained with the company CP group, both in the NDP and on the move. As a result, the mortars assumed the secondary mission of CP security and carriers were employed on the NDP perimeter. In two battalions, the mortar platoon also provided dismounted clearing patrols for the company command post NDP. Figure K-27 shows a M125A1 mortar carrier employed on a NDP perimeter.

(e) In the battalion that operated with three vehicle rifle platoons, two M113A1's were released and used to form a direct fire section in the weapons platoon. Unauthorized 106mm recoilless rifles were mounted on these vehicles. They were used to fire canister or HEP into nipa palm to detonate boobytraps. This unit considered the 106mm recoilless rifles indispensable in their AO.

### (5) Company Combat Service Support

#### (a) Company Maintenance Section

1. Company maintenance sections in the mechanized battalions frequently conducted DS-level repairs. In four battalions, the companies maintained their own PLL, which was stored in a FSB. A few high-demand repair parts were carried by company maintenance sections in the field.

2. In four battalions, the M578 recovery vehicle went to the field with the companies. It generally remained in the NDP until needed. In two battalions, the M578 moved with the company command group if terrain and trafficability permitted. In the other

K-18

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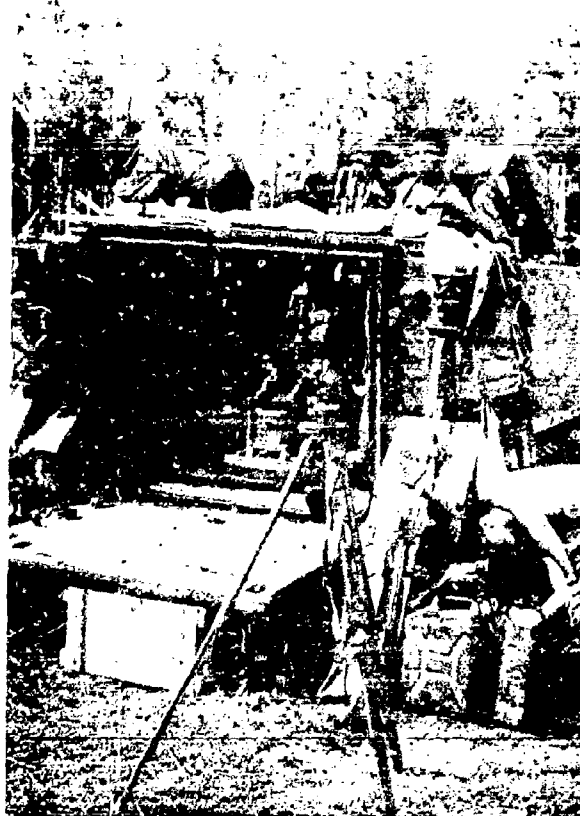


FIGURE K-27 (U). M125A1 Mortar Carrier Employed on NDP Perimeter.

two battalions, the recovery vehicles never left the roads or the FSB motor pool. In one of these battalions, the M543 attached to each company from the battalion support platoon was used for recovery because of its superior maneuverability in marginal terrain. Most company maintenance personnel expressed interest in the M113A1 (XM806E1) recovery vehicle, stating that it would complement but not replace the M578. The boom and lift capability of the M578 was highly prized.

K-49

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3. Communications maintenance performed in the companies was minimal, consisting primarily of emergency repairs, exchange, and evacuation to the battalion communications platoon.

## (b) Company Supply

In four battalions, M548's attached to each company fulfilled multiple resupply needs, since the authorized 2 1/2-ton supply truck could rarely be used. In other units, the medical evacuation vehicle and/or maintenance M113A1 were employed for ground resupply and for pulling a water trailer.

## (6) Personnel

In most mechanized rifle companies, there was a severe shortage of qualified NCOs. Most platoon sergeants were staff sergeants with less than two years service, and most squad leaders were E5's or E4's. This low level of experience created maintenance, logistical, and command problems which in turn affected unit operational efficiency.

## 3. (C) QUANTITATIVE EQUIPMENT PROBLEMS

### a. General

The quantitative equipment problems encountered in the mechanized infantry battalions are documented in this paragraph. Included are those subjects on which there was substantial agreement among the commanders and others interviewed. As an exception to this, certain background information is included for subsequent analysis of other issues. Other potential problem areas were considered during the evaluation, but were discarded after analysis indicated no justification for their inclusion. Equipment problems that relate to organizational issues, which were discussed in paragraph 2 above, are summarized in this paragraph. The qualitative aspects of equipment are discussed in Annex N. Finally, a list of MTOE authorized equipment considered unnecessary is included at Appendix 3 to Annex C.

### b. Bulldozer Equipment

Six of the eight battalion commanders stated that there was a requirement for an organic bulldozer capability to construct berms, to prepare hasty crossing sites, to level rice paddy dikes, and to dig bunkers. No commander felt the tank-mounted bulldozer or CEV would be satisfactory. Those who were familiar with the M113A1 bulldozer (ENSURE 43) thought it inadequate for their needs. They were unwilling to accept any degradation in the maneuverability or combat capability of M113A1's to achieve the desired capability.

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(2) Five of the eight commanders felt that an M113A1 bulldozer kit, more durable and rugged than ENSURE 43, would be acceptable if mounted on a maintenance vehicle. As an alternative, one commander suggested that the divisional engineer battalion be provided an armored engineer platoon for each mechanized battalion in the division. Attached engineer support would thus be equipped with compatible tracked vehicles. Each engineer M113A1 should be equipped with a dozer blade.

## c. Recovery Vehicles

The MTOE authorization for recovery vehicles was considered adequate, with the exception of a stated requirement for a recovery vehicle for the maintenance personnel in HHC.

## d. Cargo Vehicles and Water Trailers

### (1) General

Personnel in all units were dissatisfied with the authorized mix of supply vehicles. Figure K-28 shows MTOE authorization, quantities each unit had on hand, and quantities recommended to fulfill requirements.

### (2) M548, Tracked Cargo Vehicle

As seen in Figure K-28, personnel in four units felt the authorization for nine M548's was inadequate. In all battalions, the M548 was considered an indispensable asset for the conduct of ground resupply. In some units, M548's were regularly attached to the rifle companies and mortar platoon. In other units, they were sent to these elements on an as-required basis. Generally, there was a stated requirement for ten vehicles: three M548's to support the rifle companies, one to support the mortar platoon, three to carry POL, two to carry general cargo, and one to carry the welding equipment of the maintenance platoon. One battalion felt an additional M548 was needed to carry POL and/or water. The M548 was utilized in one battalion as a recovery vehicle.

### (3) M54, 5-Ton Cargo Truck

Each unit used the M54 as the primary cargo carrier in the base camp and as far forward as the FTH. As documented in Appendix 1 to Annex C, there was considerable confusion as to the number of 5-ton trucks actually authorized by MTOE. All logistical personnel felt 12 was too many and only three units felt that six was adequate. Stated requirements for M54's were related to recommendations for the M49C POL truck and the M50C water truck.

K-11

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ITEM	QTY AUTH BY MTOE	QUANTITY ON HAND/RECOMMENDED BY UNIT									
		1/61	1/50	1/16	2/2	1/5	2/22	4/23	2/47		
M548	9	11/11	7/9	7/10	5/8	5/10	8/9	9/9	7/10		
M51	12	12/8	14/8	5/9	8/6	12/6	12/6	12/9	12/8		
M45	11	12/11	10/11	13/11	10/11	11/11	10/11	11/11	13/11		
M40C	9	0/1	0/1	0/1	0/1	1/2	0/2	0/1	1/2		
M50C	9	0/1	0/2	*2	0/1	1/2	0/2	*2	*2		
WATER TRAILER	1	3/8	10/10	9/10	8/10	6/10	5/5	8/10	10/10		

\* M50C tank and bed were used mounted on an M54 5-ton truck.

FIGURE K-28 (U). Cargo Vehicles and Water Trailers Authorized and On Hand/Recommended by Battalions.

K-52

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### (4) M35, 2 1/2-Ton Cargo Truck

All personnel were satisfied with the authorization of 11 M35's. In two units, maintenance personnel favored replacing one of their two authorized M109 shop vans with an M35, in order that it might be used to support maintenance operations without recourse to support platoon assets.

### (5) M49C, 1200-Gallon POL Truck

All units expressed a requirement for at least one M49C to replace an authorized M54. This issue is discussed further in paragraph 31, below.

### (6) Water Handling Equipment

All personnel interviewed felt the quantity of authorized water handling equipment (five 400-gallon water trailers and seven 250-gallon collapsible drums) was totally inadequate. In addition to the M50C water trucks and water trailers shown in Figure K-28, all units employed between four and eight 600-gallon tanks mounted on trucks or in fixed locations. In addition, some units used drum and pump units mounted on M548's while some utilized 500-gallon collapsible drums mounted in fixed positions. No unit had on hand the authorized 250-gallon collapsible drums.

#### e. Utility Vehicle

Personnel interviewed generally agreed that the M151 1/4-ton utility vehicles authorized the two motor messengers, the three weapons platoon leaders of the rifle companies, and three battalion mortar platoon POs, were not required. Radios authorized on these vehicles were often used elsewhere.

#### f. Countermine/RPG Equipment

##### (1) General

Mines generally posed a greater threat to the mechanized infantry battalions than did RPGs. One battalion had lost 19 M113A1's to mines in a 60-day period, during which more than 130 mines had been detected or encountered in its AO. Detonation of a mine by an M113A1 usually resulted in a combat-loss vehicle.

##### (2) Countermine Equipment

(a) None of the battalion commanders had any experience with track-mounted mine rollers. Three commanders had seen vehicular mounted detectors but were not impressed with their capabilities. All

K-53

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FIGURE K-29 (U), Mine Damage to M113A1 APC/ACAV.

commanders felt that the only practical long-term solution to the mine problem was development of some type of vehicular-mounted device. Their requirements and design criteria paralleled those stated by commanders in the ACR [see paragraph 31(2), Annex G].

(b) There was a great deal of confusion concerning WFOE authorization for hand-held mine detectors. Seven of the eight battalions lacked their full authorization of 12 metallic and two nonmetallic detectors. As a result, most commanders felt that on-hand quantities were inadequate. However, once informed of the true authorization, all commanders considered it sufficient to meet their needs.

### (3) Belly Armor Kit for M113A1

Six battalions had belly armor mounted on nearly all their M113A1 APC/ACAVs. One battalion had installed all kits received, but averaged less than four per rifle company. This was considered critical as the battalion faced the greatest mine threat of any mechanized unit in RVN. One battalion had not yet received belly armor and expressed an urgent requirement for it. The general consensus among commanders, platoon leaders, and drivers was that the slight decrease in cross-country mobility was more than offset by increased crew protection.

K-54

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## (4) Counter-RPG Equipment

The main passive RPG protection used by all armored vehicles consisted of chain link fencing; emplacement, employment, and problems involved are discussed in paragraph 3i(4), Annex G. Six battalions used RPG screens regularly, while two units, which had encountered no RPG threat, carried no screens. Some units used steel planking hung on the sides of vehicles to provide standoff protection (see Figure K-30). Commanders of all units that faced RPG-equipped enemy forces stated a requirement for a passive, vehicle-mounted RPG protection, preferably internal.

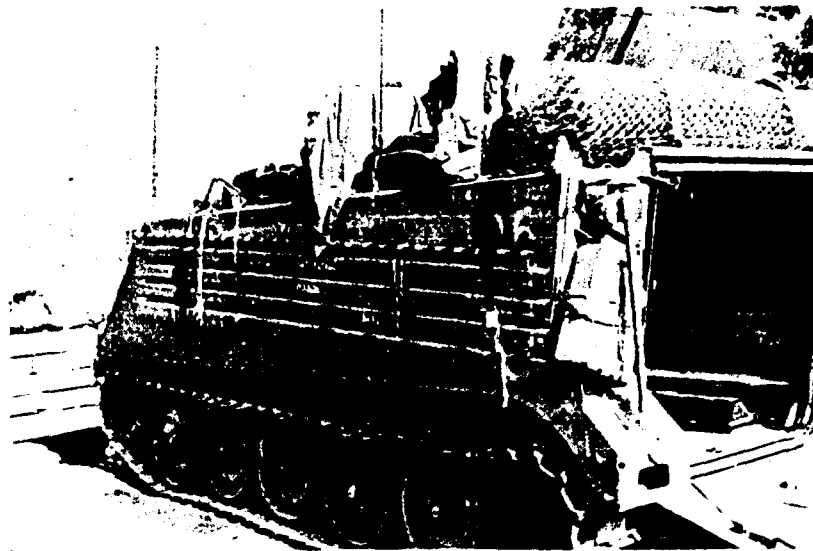


FIGURE K-30 (U). Steel Planking Used to Provide RPG Standoff Protection.

## g. Night Vision Equipment

### (1) General

With the advent of new and improved night vision devices, the interrelationships between the equipment and techniques resulted in locally adapted field modifications which had quantitative as well as qualitative impact. The various components should be considered as an integrated system.

### (2) Searchlights

All battalion and company commanders indicated a requirement for organic searchlights in mechanized infantry units in RVN. All units had used artillery or tank-mounted searchlights when available.

K-55

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and were favorably impressed. Commanders emphasized that any searchlight provided must possess certain specific features. It should be small enough for one man to handle, easy to remove from its mount for daylight storage inside the vehicle, and have operating characteristics similar to the AN/VSS-3. Even though one commander felt that every tracked vehicle should be authorized a searchlight, most commanders desired them on the basis of one per rifle platoon and scout section.

### (3) Passive Night Vision Devices

(a) Mechanized infantry battalions were authorized a total of 142 passive night vision devices by MTOE. The authorization for each type of device and actual quantity on hand in each unit during the evaluation as reflected by the property books is shown in Figure K-31.

ITEM	QTY AUTH BY MTOE	QUANTITY ON HAND IN UNITS							
		1/61	1/60	1/16	2/2	1/5	2/22	4/23	2/47
AN/PVS-1/2/2A	62	61	55	58	52	34	37	35	59
AN/PVS-3	0	16	1	0	21	19	5	6	21
AN/TVS-2/2A	69	68	71	66	65	71	72	65	35
AN/TVS-4	11	3	13	9	9	6	6	5	11

FIGURE K-31 (U). Passive Night Vision Devices On Hand in the Mechanized Infantry Battalions.

(b) The infantry units relied heavily on the individual starlight scope (AN/PVS-1/2) because of extensive dismounted night operations and ambushes. All commanders felt that the quantity of individual starlight scopes authorized should be increased. The specific quantities considered necessary by different commanders were influenced by the quantity of operational devices on hand. Those units that concentrated on night operations generally wanted the greatest number of devices. Commanders in five battalions felt that there was a requirement for three or four individual starlight scopes per squad, while the remainder considered two per squad sufficient.

(c) All commanders were satisfied with the authorization of 11 medium-range night observation devices (AN/TVS-4). This device was used mainly in FSBs, base camps, and NDPs.

K-56

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(d) Seven of the eight commanders felt that the quantity of crew-served-weapon sights (AN/TVS-2) should be increased to provide one per tracked vehicle, to include mortar and flame carriers. This would represent an authorization increase of 14 per battalion.

## (4) Infrared Equipment

Infrared driving devices were rarely employed. Two battalions had placed their IR equipment in storage. Most commanders considered it inadequate for use in cross-country movement, due to lack of depth perception. A few commanders stated IR equipment would have been more extensively used if vehicle commanders had the M18 binoculars or other IR viewing means. The driver was the only crew member having an IR viewing capability.

## h. Weapons

### (1) General

Requirements for weapons mixes varied considerably from one battalion to another based on characteristics, population density, and missions assigned. The stated requirements of commanders operating in heavy jungle directly reflected those expressed by commanders who operated in or near populated areas.

### (2) M113A1 APC/AAV Weapons

(a) All battalions had the complete MTOE authorized Armament Subsystem. A majority of their M113A1's. The other six battalions had most of the caliber .50 ballistic shield and cupola but did not use side M2 machinegun shields or mounts. These commanders felt that there was not enough room on top of the M113A1 to carry six to nine inchmeters if they were installed. Only one commander was fully satisfied with the authorized mix of two M60 Machineguns and one caliber .50 machinegun on the M113A1 APC/AAV. Most commanders wanted varying quantities of additional armament.

(b) Commanders operating in dense jungle generally wanted one 4.2 inch mortar per tracked vehicle, one 7.62mm minigun per tracked vehicle, and one M60 machinegun per carrier for continued use in both dual mounted/dismounted roles. The caliber .50 machinegun was desired because of its ability to penetrate heavy vegetation. Also, it was only feared by the enemy. The minigun was wanted for its capability to deliver a heavy volume of suppressive fire. They did not want automatic grenade launchers.

(c) Commanders operating in fairly open, sparsely populated areas wanted one 4.2 inch automatic grenade launcher and one 7.62mm minigun per tracked vehicle in addition to the authorized weapons.

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(d) Commanders of battalions operating in heavily populated areas could rarely fire their caliber .50 machineguns because of danger to the local civilian population. These commanders stated a requirement to replace the caliber .50 machineguns with two 40mm automatic grenade launchers and two 7.62mm miniguns per platoon. These weapons could provide short-range controlled suppressive fire and did not have the lethal range of the caliber .50 machinegun. They felt it necessary to retain the two M60 machineguns per tracked vehicle.

(e) All commanders agreed that the armament authorized the scout platoon should be augmented because the scout platoon was used primarily for mounted combat. The general feeling was that the scout platoon required two caliber .50 and two M60 machineguns per vehicle, and one 40mm grenade launcher and one 7.62mm minigun per section. The total requested was 20 caliber .50 machineguns, 20 M60 machineguns, two 7.62mm miniguns, and two 40mm automatic grenade launchers per scout platoon.

## (3) Sniper Weapons

Mechanized infantry battalions were authorized 10 national match-grade M14 rifles with telescopic sights, throughout most of the evaluation period. Seven commanders felt that this sniper equipment should be retained in the MTOE. They also felt that training and maintenance should be consolidated at brigade or division level. The actual quantity of sniper equipment and trained snipers desired varied, but was normally expressed as two per platoon or one per squad.

## (4) 90mm Recoilless Rifles

There was little agreement among commanders concerning the desirability of the 90mm recoilless rifle. Three commanders emphatically stated that it should be retained for its antipersonnel flechette capability. Three other units had stored their 90mm recoilless rifles, stating that the LAW fulfilled its intended role. In the other two units, opinions expressed were varied. A few commanders considered that the LAW could replace the 90mm recoilless rifle if an antipersonnel round was developed. In those units that carried the 90mm recoilless rifles, the weapon was infrequently used.

## (5) Flame Weapons

### (a) Portable Flamethrower

The mechanized battalions were authorized nine M9-7 portable flamethrowers. Only two battalions had ever used these weapons. One had employed it an average of once a week while the other employed it less frequently. The other six commanders saw no reason to retain the portable flamethrower because the M132A1 mechanized flamethrower and XM191 flame weapon satisfied the battalion's requirement.

K-58

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## (b) XM191 Multi-Shot Flame Weapon

Six battalions had received and used the XM191 multi-shot flame weapon (consisting of the XM202 rocket launcher and XM74 rocket clip) before or during the evaluation. All commanders were impressed by its accuracy, simplicity, and convenience. Four commanders felt it was a suitable replacement for the portable flamethrower, while two considered it a useful supplement. They felt that the XM202 launcher should be authorized on the basis of one per platoon/scout section.

## (6) Supply Vehicle Weapons

Personnel in five of the battalions felt that the caliber .50 machineguns authorized on the supply vehicles should be replaced with M60 machineguns. The reasons cited were that the M60 was lighter, easier to fire and maintain, and could be ground-mounted by one man.

## (7) Machineguns

There was a substantial number of unauthorized machineguns in most battalions. These weapons were used to augment authorized track armament and to provide weapons for rear area security requirements without taking weapons from the combat elements.

## i. Communications Equipment

### (1) General

The quantitative adequacy of authorized communications equipment was difficult to assess. The mechanized battalions were generally able to maintain effective communications. However, as indicated in Appendix 2 to Annex C, there was a substantial quantity of unauthorized equipment on hand. The communications equipment requirements were a function of the interrelationship between the level of communication equipment repair authorized, the operational requirements, and equipment usage for purposes not intended, as discussed in Annex P. The identifiable problems noted in this paragraph.

### (2) FM Radios

#### (a) Battalion Headquarters

The first consideration of radios used in the eight battalion headquarters was the requirements of the controlling headquarters, liaison requirements, base camp and FSB security requirements, mission variation, and other variables. At the time of the evaluation, each battalion was operating in from five to seven FM radio nets, three or four of which operated in the secure mode, or had to have a secure capability. Annex P contains diagrams of the average net

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configurations and equipment used by these units. In addition, some units were required to monitor up to three additional nets. As a result, each battalion remained flexible in configuring its assets to meet requirements. Because of this, it was impossible to precisely identify what additional equipment was needed. In general, however, the peculiarities of stability operations generated additional communications needs, over and above conventional requirements. Figure K-32 summarizes the total quantities of major items of FM equipment authorized and utilized by the battalion headquarters companies in multiple locations.

ITEM	MTOE AUTH	IN USE							
		1/61	1/50	1/16	2/2	1/5	2/22	4/23	2/47
AN/VRC-12	3	3	2	2	3	3	3	3	3
AN/VRC-46	18	24	22	31	33	24	26	30	32
AN/VRC-47	13	12	14	12	10	15	14	13	12
AN/VRC-49	1	1	1	1	1	1	1	1	1
AN/VRC-53	4	5	5	4	5	5	4	2	5
AN/VRC-125	8	8	8	4	4	8	8	7	8
AN/PRC-25	6	9	8	8	2	10	7	10	9
TSFC/KY-9	2	2	2	2	2	3	3	3	3
TSFC/KY-38	0	4	5	5	5	5	6	4	5

FIGURE K-32 (C). Utilization of FM Radio Equipment in Mechanized Infantry Battalion HHCs (U).

## (b) Command Vehicle Radios

Commanders at all levels considered the authorization of command radios inadequate. Virtually all battalion and company command M113A1s had been equipped with a second or third receiver-transmitter. The rationale for the additional equipment was to provide the commanders with the capability of maintaining continuous communication in at least two nets.

## (c) Company CP Vehicle Radios

Nearly all companies had equipped the second M113A1 in company headquarters with two receiver-transmitters to provide a company VCS with a continuous two-net capability. The authorized AN/VRC-47 was generally considered inadequate to perform this function.

K-60

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## (d) Rifle Platoon/Squad Radios

1. In all units where a majority of operations were conducted at platoon level, the platoon leader's authorized AN/VRC-47 radio was considered inadequate. It was felt that two receiver-transmitters were required.

2. The rifle platoon was authorized one AN/PRC-25/77 radio. All commanders and platoon leaders interviewed considered one radio inadequate to support dismounted and night operations. As an example, two major headquarters required each ambush to have two portable radios, one for command and one for artillery fire support. This requirement was met by dismounting AN/VRC-53 radios from squad carriers. This was considered a self-defeating solution, as the rifle platoon M13A1's were used for fire support or as a reaction force and required communications to perform these missions. All commanders expressed an urgent requirement for one AN/PRC-25/77 per rifle squad to support dismounted and night operations.

3. Each rifle platoon was authorized six AN/PRC-88 helmet-mounted squad radios. The AN/PRC-88's were not used in six battalions and used only occasionally in the other two battalions. Most commanders and platoon leaders considered the AN/PRC-88 fragile, unreliable, and possessing an inadequate range capability. Also, maintenance downtime was excessive. The battalion which employed the AN/PRC-88 the most relied on it for internal communications in ambushes and TDPs. It was not used for command and control between platoon and squad level.

## (e) Scout Platoon Radios

1. In all battalions, the radios authorized the scout platoon leader and platoon sergeant were considered inadequate. It was felt that they both required two receiver-transmitters, since the two sections were frequently employed as independent maneuver elements. In all battalions, a second radio receiver-transmitter had been mounted in both vehicles.

2. The scout platoon was not authorized any AN/PRC-25/77 portable radios. All commanders felt the platoon required one portable radio per scout squad to support dismounted night ambushes.

## (f) Mortar Platoon FDC Radios

The mortar platoon FDC M577A1 was authorized one AN/VRC-47 and one AN/VRC-53 radio. These were inadequate to maintain communications in three nets (battalion command, artillery fire request, and platoon command) and to monitor up to three additional nets (the supported company, artillery control, and battalion logistical). Mortar personnel interviewed stated that replacement of the AN/VRC-47 with an AN/VRC-44 would provide the required capability.

K-61

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## (g) Support Battalion Radios

Commanders and logistical personnel expressed a requirement for portable radios to use in the M548's and for control of air resupply operations.

## (h) Secure Equipment

1. As indicated in Figure K-33, on-hand secure voice communications equipment exceeded MTOE authorization. Heavy reliance on secure FM for the brigade command net, battalion command net, and, in some units, the administration and logistics net, multiplied requirements for secure communications equipment.

ITEM	QTY AUTH	QUANTITY ON HAND IN UNIT							
		1/61	1/50	1/16	2/2	1/5	2/22	4/23	2/47
TSEC/KY-8	2	4	4	2	2	9	3	3	4
TSEC/KY-38	0	9	9	5	10	13	14	13	9

FIGURE K-33 (C). Secure FM Radio Equipment On Hand, Mechanized Infantry Battalions (U).

2. Although all battalions exceeded their authorization for secure equipment, they generally considered the quantity on hand insufficient. Without considering the qualitative and interface problems discussed in Annex N, commanders stated that the minimum quantity required for the entire battalion was 30. However, six battalion commanders said that a secure capability should extend down to platoon level, once interface problems had been solved. Figure K-34 shows the desired location for secure equipment in two suggested BOIs: one for minimum command and control and logistics, and one to include platoon level.

3. In each battalion, the artillery liaison team and FO teams with the line companies borrowed secure equipment. Every commander considered it essential that the artillery not have a secure capability.

## (3) AM Radios

All commanders interviewed considered the MTOE authorization for AM radio/RTT equipment adequate. There was no requirement for AM voice nets.

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LOCATION	MINIMUM REQUIREMENT	REQUIREMENT TO INCLUDE PLATOON LEVEL
Bn CO	2	2
Bn XO	1	1
S2 M577A1	1	1
S3	2	2
S3 Operations	2	2
S1/S4	2	2
S5	1	1
Arty LNO	2	2
LNOS	2	2
HHC	1	1
Rifle Company CO	1 (3)	1 (3)
Rifle Company XO	1 (3)	1 (3)
Rifle Company	1 (3)	5 (3)
Service Company CO	1	1
Scout Platoon	2	2
Mortar Platoon	2	2
Flame Platoon	0	1
Support Platoon	1	1
TOTAL	30	44

FIGURE K-34 (C). Proposed Location of Secure Equipment (U).

K-63

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### (4) Rectifiers

Personnel interviewed expressed a requirement for a total of six PP-1104/G rectifiers to provide DC power for radios used in FSRs and base camps.

### (5) Antennas

#### (a) RC-292 Antennas

The battalion was authorized a total of 12 RC-292 antennas. This quantity was considered inadequate by all commanders and communications personnel. Units requested authorization for additional RC-292's to support widely dispersed operations. The specific additional quantities requested ranged from five to ten, with an average of six.

#### (b) AB-577 Antenna Base

Five battalions had obtained AB-577's. Each of these units considered two AB-577's to be highly desirable, one for the battalion forward TOC and one for the rear CP. The advantages of the AB-577 are discussed in paragraph 31(5), Annex G. The configuration of the AB-577 antenna base is shown in Figure K-35.

### (6) Communications Nets

The number of radio nets and usage of traditional nets varied in RVN. The average radio net requirements, with explanatory notes, are depicted in Annex P.

### J. Early Warning Equipment

#### (1) Radar Equipment

All but two battalion commanders were satisfied with MTOF authorizations for two radar sets. Two commanders wanted it increased to five.

#### (2) Early Warning Devices

(a) Mechanized infantry battalions were authorized 54 GSS-9 break-wire intrusion detection devices by MTOF. Five battalions had none on hand; three battalions had a limited quantity. Those that had employed the GSS-9 were not impressed with its capabilities.

(b) Six battalions had from one to five PSID seismic intrusion devices on hand. Four units employed these devices regularly on ambushes and for NDP early warning. User knowledge concerning the PSID was very limited. Two battalions had consistently achieved

K 12

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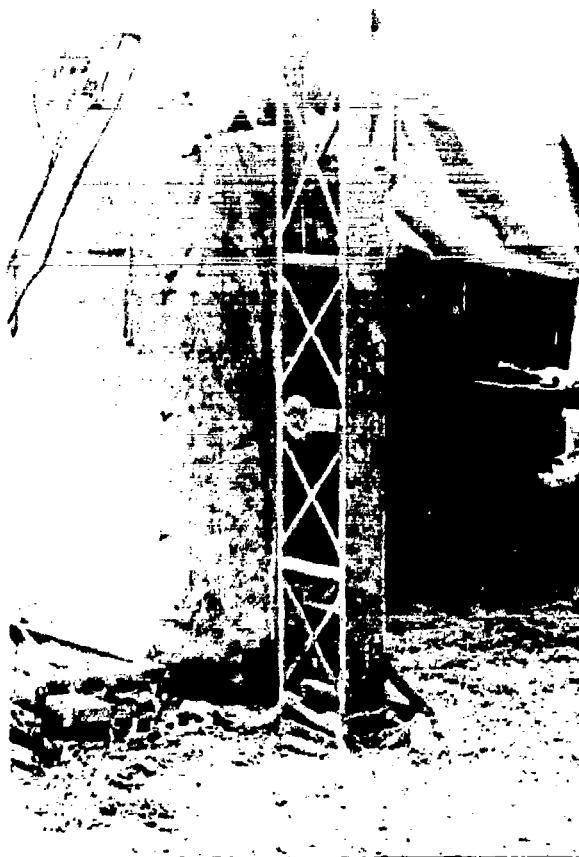


FIGURE K-35 (U). AB-577 Antenna Base.

excellent results with the device and considered it a valuable asset. Five commanders stated a requirement for one per platoon. One commander who had emphasized its employment asked for one per squad to replace the GSC-9.

k. Navigation Equipment

Ground vehicle navigation in dense vegetation was a continuing problem in the mechanized infantry battalions. The problem and suggested solutions were identical to those discussed in paragraph 3n, Annex G.

K-69

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## 1. Accessory Equipment

### (1) General

Each battalion commander felt several accessory items of equipment were needed that were not authorized by the MTOE. Those varying discussions are considered below. Each battalion also had certain items authorized which were not needed. These items are enumerated in Appendix 3 to Annex C.

### (2) Steam Jenny

Commanders and maintenance personnel in six battalions considered a steam jenny a requirement in the battalion maintenance platoon for the reasons stated in paragraph 30(2), Annex G. Personnel in the other two battalions felt use of this equipment would be impractical because of the lack of hardstands and adequate water sources.

### (3) Air Items

Clarification and recognition of equipment authorizations in USARV Regulation 750-15 constituted the only problem in this area.

### (4) POL Handling Equipment

#### (a) Fuel Transfer Pump

Personnel in all mechanized infantry battalions, and particularly those conducting extensive air resupply of POL, felt portable fuel transfer pumps were needed. Several units fabricated POL pumps from the 44 GPM bilge pumps installed in the M113A1.

#### (b) Delivery Equipment

The two authorized drum-and-pump units were considered insufficient for field delivery of POL. All battalion commanders stated a requirement for an M49C. This vehicle would be used primarily to re-fuel vehicles in the base camp/FSB or to refill collapsible drums. A requirement was also stated for three to four tank-and-pump or drum-and-pump units to be mounted on the POL delivery M548's discussed in paragraph 30(2), above.

### (5) On-Vehicle Recovery Equipment

The problems stated in paragraph 30(7), Annex G apply to mechanized infantry battalions. Personnel interviewed stated a requirement for one light tow bar and one heavier 50-foot tow cable per platoon/section, and one heavier 20-foot tow cable per vehicle. All personnel

K-66

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interviewed concerning the self-recovery kit on the Australian fitter's vehicle stated that it would be an excellent accessory for the M113A1 BII (see Annex L).

(6) Shop Equipment Set, Common No. 1

Maintenance personnel stated that a Shop Equipment Set, Common No. 1, was needed for HHC maintenance operations.

K-67

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## ANNEX L

### AUSTRALIAN ARMORED FORCES IN VIETNAM

#### 1. (C) INTRODUCTION

a. The Australian Task Force was operating in Phuoc Tuy Province, in southeastern III CTZ, during the evaluation. The task force was composed of three infantry battalions, an engineer battalion, an artillery regiment (three batteries of 105mm howitzers), a tank squadron, a cavalry squadron, and normal logistical and support elements.

b. The armored elements of the Task Force were employed mainly for infantry support. During the 6 months prior to March 1970, only one significant independent armor operation had been conducted: A tank/cavalry task force (MATILDA) swept through Binh Tuy province on a show of force/reconnaissance mission.

#### 2. (C) ORGANIZATION

##### a. Tank Squadron

##### (1) General

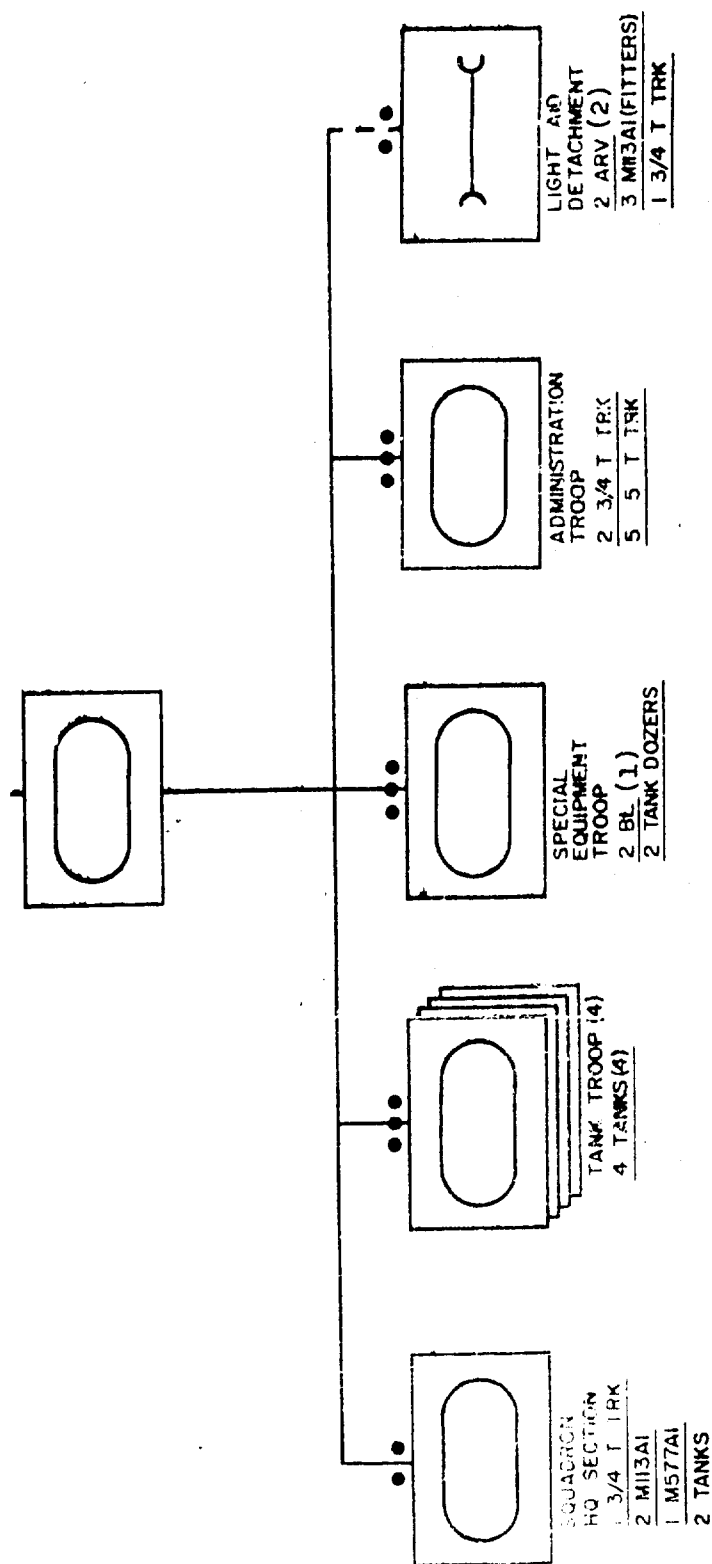
The tank squadron shown in Figure L-1 was roughly comparable in size to a US tank company. As it was the only Australian tank unit in RVN, it had been augmented with a Special Equipment Troop and a Light Aid Detachment (LAD) squadron section, to make it more self-sustaining. The squadron was equipped with Centurion MK-V tanks, each armed with a 20-pounder main gun (roughly 76mm), one ranging machinegun (a caliber .50 similar to the ranging gun on the 106mm recoilless rifle), and two caliber .30 machineguns. The Centurion tank had a gasoline engine, which limited its operating range to approximately 50-60 miles, and created a refueling problem of major proportions.

##### (2) Squadron Headquarters

Squadron headquarters was primarily a tactical control group consisting of four officers and 17 other ranks. The officer in charge (OIC) was a major, with a captain as second in command (2IC). The captain served as both a tactical and administrative/logistical deputy, as contrasted to the primary logistical functions of a US company executive officer. The headquarters also contained an ordnance technical officer (TO), who provided technical assistance for maintenance support, and a liaison officer who performed liaison and intelligence functions. The headquarters was equipped with two control (command) tanks, an M577A1 CP vehicle and four M113A1's (two in a standard configuration, one for use as a tracked ambulance, and one equipped with a T-50 Cadillac Gage machinegun turret).

L-1

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NOTES:

(1) Bridge Layer: A track-mounted single-span bridge comparable to the AVLB.

(2) Armored Recovery Vehicle: Comparable to the M88 VTR.

FIGURE L-1 (U). Tank Squadron Organization, Royal Australian Task Force - Vietnam.

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### (3) Tank Troop

The squadron contained four tank troops, each consisting of four Centurion MK-V tanks. Each troop was commanded by a lieutenant and was roughly comparable to a US tank platoon. Operationally, however, only three tanks were normally employed, the fourth on a rotational basis, standing down for maintenance and crew rest. The tanks mounted both US AN/VRC-12 FM-series radios and British VHF radios, which were not compatible. The VHF was used for internal troop communications and the FM for communication with the infantry.

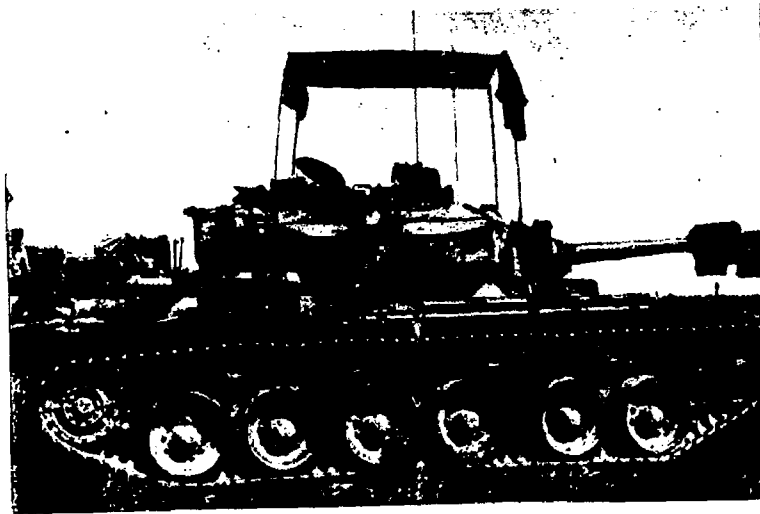


FIGURE L-2 (U). Centurion MK-V Tank.

### (4) Special Equipment Troop

The special equipment troop consisted of two bridge-layers (BL) and two tanks equipped with bulldozers. The BL was a singlepiece, 52-foot span, Class 80 bridge mounted on a Centurion chassis. The bulldozer was a heavy-duty blade mounted on a Centurion MK-V tank. It was used to perform tasks similiar to those of the US CEV.

### (5) Administration Troop

The Administration Troop was organized to perform squadron combat service support, to include mess, quartermaster supply, and resupply operations. At the time of the evaluation, it was equipped with wheeled vehicles.

L-3

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## (6) Light Aid Detachment (LAD), Squadron Section

The LAD consisted of one armored recovery vehicle, three M113A1 fitters' (mechanics) vehicles, a maintenance officer, three warrant officers, and several other ranks. The section was attached to the squadron from the regimental LAD. It would roughly equate to an attached team from a divisional direct support battalion.

## b. Cavalry Squadron

### (1) General

The cavalry squadron, shown in Figure L-3, was comparable in size to a heavily reinforced US cavalry troop. Like the tank squadron, it had been augmented with a Light Aid Detachment (LAD), squadron section, to make it more self-sustaining. In US terms, the cavalry squadron was more like an armored personnel carrier/transportation unit than a cavalry unit. It was equipped with M113A1 APCs that mounted T-50 Cadillac Gage turrets, containing either one caliber .50 machinegun and one caliber .30 machinegun, or twin caliber .30 machineguns.

### (2) Squadron Headquarters

The cavalry squadron headquarters was similar to the tank squadron headquarters in personnel and functions. It was equipped with three M113A1 APCs (two command vehicles and one tracked ambulance) and one M577A1 CP vehicle.

### (3) Cavalry Troop

The cavalry troop, shown in Figure L-4, was organized with a troop headquarters and three sections. All M113A1's carried a crew of two, the driver and gunner/track commander. The cavalry troop was designed to carry an infantry company, each section carrying one rifle platoon, and the troop headquarters carrying the infantry company headquarters elements. Each M113A1 mounted two radio receiver-transmitters, one for internal troop/section communications, and one to enable the transported infantry to communicate while mounted.

### (4) Support Troop

The Support Troop was organized as shown in Figure L-5. The troop headquarters was strictly an administrative headquarters rather than a tactical control element, as APC and mortar sections were normally attached to cavalry troops. The two APC sections were used to augment cavalry troops, each having the ability to transport an additional infantry platoon. The mortar sections were used to transport, and to serve as firing platforms for, infantry-provided 81mm mortars. As in the case of the APCs, each

L-4

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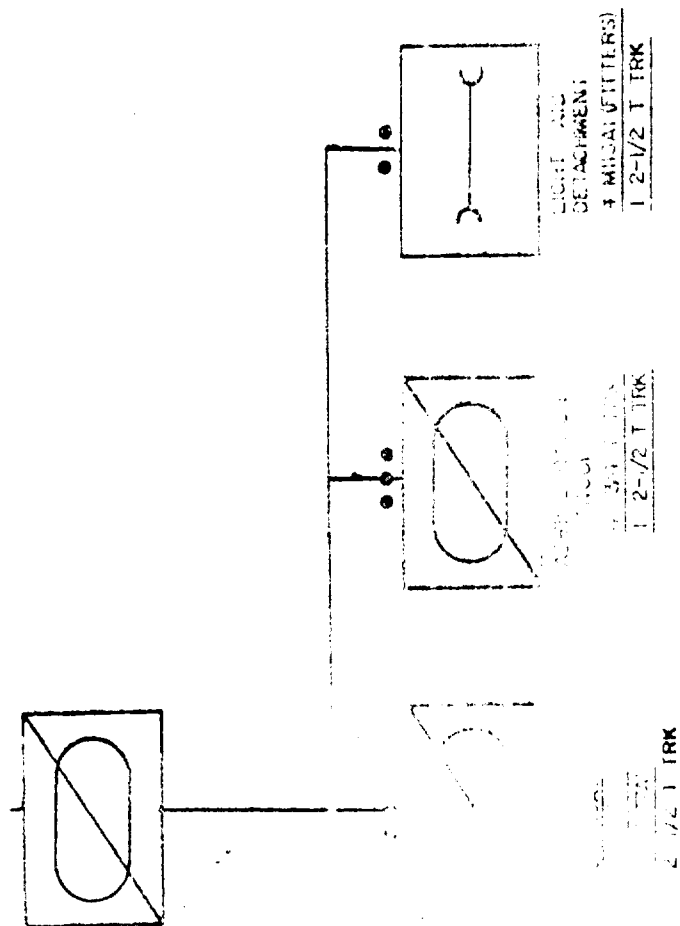


FIGURE 1-3 (U). Cavalry Squadron Organization, Royal Australian Task Force - Vietnam.



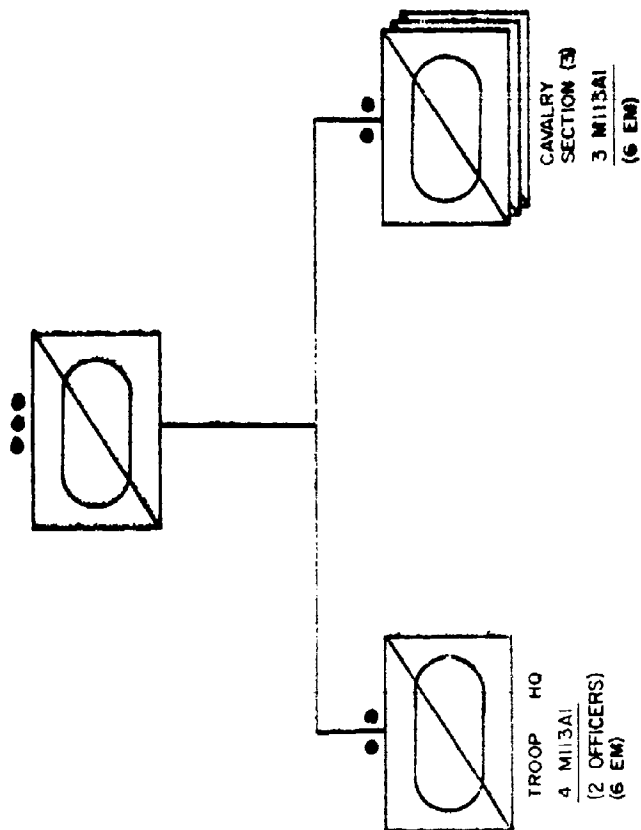
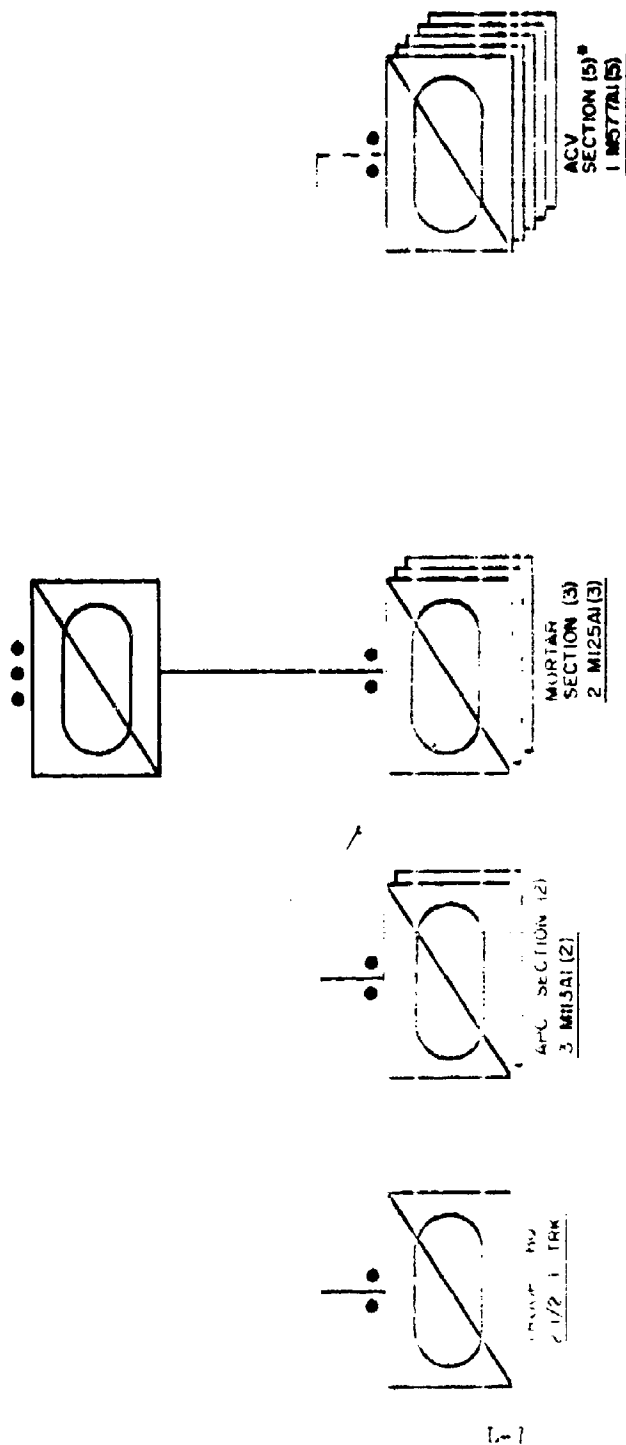


FIGURE L-4 (U). Cavalry Troop Organization.



- \* Armored Command Vehicle Section was a Task Force Asset located in the Cavalry Squadron, Support Troop for Control and Maintenance.

FIGURE 2-5 (U). Cavalry Support Troop Organization, Royal Australian Task Force - Vietnam.

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M125A1 had a two-man crew. The mortars were manned and fired by infantry mortarmen, not personnel organic to the troop. The five ACV sections (one each M577A1) were Task Force assets attached to the troop for maintenance support. They were used to provide command posts for infantry battalions when needed.

## (5) Administration Troop

The Administration Troop provided routine administrative and resupply support to the squadron in the same manner as the administration troop of the tank squadron.

## (6) Light Aid Detachment, Squadron Section

The LAD consisted of four M113A1 fitters' vehicles, a maintenance officer, three warrant officers, and several other ranks.

## c. Detachment - Forward Delivery Troop

The detachment from the Royal Australian Armored Corps (RAAC) Forward Delivery Troop had no parallel organization in the US Army. It consisted of a minimal administrative headquarters, containing two M113A1's with crews, five Centurion MK-V tanks with crews, and one control (command) tank, with reduced crew. Its mission was to train, hold, and provide, as required, both individual and crew replacements to the tank and cavalry squadrons to replace battle casualties. It also replaced lost or salvaged vehicles and equipment. This element also served as a ready reaction force for base camp defense.

## 3. (C) OPERATIONS

### a. Tank Operations

#### (1) General

The tank squadron was normally required to maintain one tank troop in Nui Dat Base Camp as part of the Task Force ready reaction force. The remaining three troops were employed supporting the three infantry battalions. The tanks were utilized to attack bunker complexes, provide direct and indirect fire support, and for reconnaissance and ambush missions similar to US employment of tanks with dismounted infantry.

#### (2) Organization for Combat

The tank troop, supporting an infantry battalion, was normally accompanied by a team of engineers to detect and clear mines, and a fitters' vehicle from the squadron LAD. If a second troop was required, the squadron second in command (2IC) assumed command and acted as the armored advisor to the infantry commander. The squadron commander was also the armored advisor to the Task Force commander.

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## (3) Tactics and Techniques

The formations and operational techniques employed did not vary appreciably from those employed by US tanks in support of dismounted infantry. In contrast to evolved US usage, the Australian four-man tank crews functioned in a conventional manner. The gunner remained inside the turret. The Australians used a kinetic energy AP round for bunker busting, followed by an HE round. US tanks did not carry AP ammunition. The Centurions also habitually carried an infantry basic load of small arms ammunition to enable a tank RRF or relief force to resupply the supported infantry. To minimize abuse of equipment, tanks were rarely used intentionally for jungle busting.

## (4) Correlation

While the armor doctrine of both countries is similar, in the RVN context the Australians think of their tanks more as an infantry support weapon. The US has not fully accepted this position. Like their US counterparts, the Australian tankers stressed the tremendous psychological effect of the presence of tanks on the battlefield. They also stressed the fact that mines were their greatest threat and that VC mining activity became more effective the longer an armored unit operated in a fixed area. This was a definite problem for the Australians in their fixed AO. In contrast to US tank operations, the Australians never lacked for dismounted infantry. Except for the relatively rare requirements for massed armor, the small Australian tank formations, working closely with infantry, were more effective on a tank-for-tank basis than US equivalents.

## b. Cavalry Operations

### (1) General

While the cavalry squadron conducted a variety of missions, its primary purpose was to transport and support infantry. Like the tank squadron, it was required normally to maintain one cavalry troop at Nui Dat Base Camp on 30-minute standby status as part of the task force ready reaction force. The remaining troops were used for either independent missions or infantry support. Independent missions were mainly of a security nature, including convoy escort, Rome Plow security, route security and clearance, and patrol insertions and extractions.

### (2) Organization for Combat

Generally, a cavalry troop or individual sections supported each infantry battalion. If the infantry was operating outside the range of supporting artillery, a mortar section from the support troop was attached. Engineer teams normally accompanied each troop or section. When

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operating independently, cavalry elements received infantry support on the basis of an infantry platoon per cavalry troop. This reinforcement was required, as the M113A1's had only a two-man organic crew as opposed to the five-man crew in US cavalry units.

## (3) Tactics and Techniques

The techniques employed by Australian cavalry in conducting independent security or road clearance missions were similar to those used by US cavalry or mechanized infantry units. When transporting infantry, the cavalry commander assumed command of the mounted element. Once contact was made, or when the infantry dismounted, the infantry commander assumed control. During infantry reconnaissance or search-and-clear operations, the M113A1 carriers were employed either as a maneuver element, or to support by fire, or as a blocking force, much the same as US mechanized infantry mounted/dismounted operations. At other times, the cavalry would return to a FSB/operational base to transport another infantry element to its assigned area. This was strictly an armored transportation role. The cavalry was rarely used for mounted reconnaissance operations in the manner of US cavalry units.

## (4) Correlation

The Australian use of cavalry differed from that of the US. Their cavalry fulfilled three functions: it served as a transportation unit; it occasionally operated in a manner similar to carriers organic to mechanized infantry; and, in the execution of security operations, they performed a cavalry function (however, the unit had to be augmented). Certain comparative observations are noted below.

(a) As compared to the tank squadron and based solely on a US rationale, discounting particular Australian problems and constraints, it was felt that the full offensive potential of their cavalry unit was not utilized. The fighting potential of the M113A1 was not fully exploited.

(b) When employed for security operations, the unit had to be reinforced with nearly all assets required except the carriers themselves. This is not as desirable as having required resources organic to the unit.

(c) It appeared that the concept of employment of the mortar sections of the support troop was awkward by US standards. To be efficient, it presupposes a high degree of cross-training of infantry mortarmen. Also the M125A1's, lacking mortars, were of no value except when attached to the infantry.

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(d) In the equipment area, two observations were made:

1. The T-10 Cadillac Gage turret installed on most M113A1's was of dubious value. It was not particularly liked by the users. Similar problems were noted in the ACTIV evaluation of the XM706, Commando Armored Car, which mounts essentially the same system.

2. The Australians welded a piece of armor plate on the top forward portion of the left-hand trackwell on M113A1's to provide additional driver protection from mines. This is a fine idea, and it is recommended that this modification be added to the US M113A1 Belly Armor Kit, Figure L-6.



FIGURE L-6 (U). M113A1 Trackwell Armor.

#### 4. (C) LOGISTICS SUPPORT

##### a. Resupply Operations

Resupply of armored and mechanized elements was accomplished extensively by air. Air resupply techniques were similar to those used by US forces. When roads were available, resupply was also conducted overland using Administration Troop vehicles. The Task Force did not have the M548 tracked cargo vehicle in RVN, although their doctrine provided for its use. The tank squadron had a considerable problem in POL resupply due to the limited cruising range of the Centurion.

L-11

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## b. Maintenance Operations

### (1) LAD Squadron Sections

Each squadron had a LAD squadron section. Each LAD was organized to facilitate repair of the equipment of the support squadron and to provide back-up recovery. The section performed what amounted to both organizational and direct support maintenance. Items that could not be repaired by the squadron LAD, were repaired, either in the forward area or the rear, by the regimental LAD, headquarters section. The primary criterion for determining the level at which an item would be repaired was the time required to perform the task. Squadron sections normally did not perform tasks taking more than a few hours. This system, which was dependent on superbly trained mechanics, was extremely responsive to unit requirements.

### (2) Automotive Repair and Recovery

The LADs were equipped with tools and recovery vehicles compatible with vehicles of the squadron. Initial repair and recovery efforts were made by the combat vehicle crew and with other combat vehicles. If a task was beyond their capacity, the squadron LAD sent a fitters' vehicle to the site. The fitters' vehicle was a modified M113A1, which had a 6800-pound crane for removing power packs, a removable cargo compartment roof to facilitate carrying power packs in the vehicle, and a set of tools and welding equipment for use by the fitters. If they could not perform the repair, the regimental LAD commander was contacted. For heavier recovery tasks, there were two Centurion Class Armored Recovery Vehicles (ARV) in the Task Force. The ARV was limited in its capabilities, as it lacked a lift capability.

### (3) Communications Maintenance

The squadron LADs performed virtually all repair on AN/VRC-12-series radios. In the squadrons, radios seldom remained inoperative for more than an hour. All required tools, test equipment, and repair parts were available in the squadron LAD. It also maintained a float of radios, which provided for immediate replacement of inoperative equipment. This system is certainly worthy of emulation.

### (4) Repair Parts Supply

Each LAD maintained repair parts similar to the US PLL. Parts resupply was obtained from the Task Force LAD.

### (5) Scheduled Services

The Task Force had a series of scheduled inspections, tests, and adjustments on all armored vehicles. These schedules were very diligently followed and manifestly improved maintenance.

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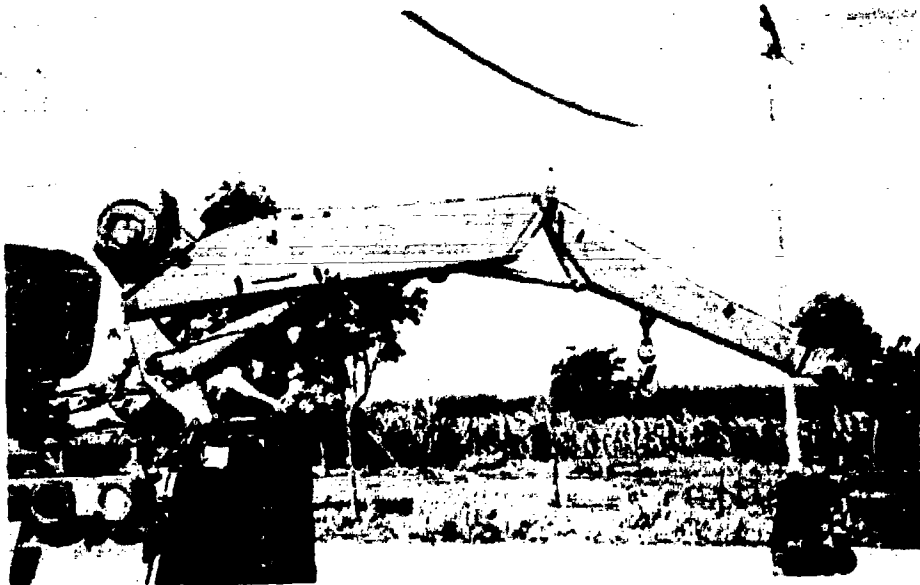


FIGURE L-7 (U). Fitters' Vehicle Crane.

c. Medical Support

M113A1 ambulances were provided on the basis of one per tank squadron and cavalry troop. Each squadron had a medical officer and several enlisted medical specialists. The Australians used air evacuation in much the same way as US "dustoff".

L-13

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## ANNEX M

### SUMMARY OF RECOMMENDATIONS

Conclusions drawn from this study are that the basic MTOEs of armored and mechanized units in RVN are sound, but that, based on the peculiar environment of the RVN conflict and the experience gained therefrom, certain changes should be made to improve the mix of organizational elements and equipment for armored-type units in RVN. This Annex summarizes the study recommendations and includes a number of additional recommendations which pertain to specific type units. The type of unit or units to which each recommendation applies is indicated along with each recommendation. Recommendations are grouped according to the most applicable of the five major functions of ground combat (Figures M-2 thru M-6). Most major organizational changes have been listed under "Command and Control" (Figure M-5). Minor personnel adjustments have been categorized under "Support" (Figure M-6). Where applicable, reference is made to Section III, Volume I or to the annex dealing with the type of unit affected. Recommendations which pertain solely to qualitative equipment improvements or modifications are dealt with in Annex O. Study correlation with the MACOV report is contained in Annex D. In many cases, the recommendation has already been locally implemented. Most equipment and personnel requirements can be met through trade-offs and available unit excesses. In some cases, action required is a turn-in of equipment. Many other resource requirements can be met from redeployment assets. While implementation of these recommendations is specifically directed toward armored and mechanized units in RVN, consideration should also be given by appropriate DA agencies for wider application. Figure M-1 summarizes the major resource requirements for implementation of these recommendations.

M-1

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RESOURCE	APPLICABLE UNITS				
	ACR	DIV CAV SQDN	SEP CAV TRP	TANK BN	MECH BN
1. <u>Personnel</u>	+21	+15	+8	+14	+4
2. <u>Combat Vehicles</u>					
M113A1 APC/ACAV	+2	+1		-3	-1
3. <u>Combat Support Vehicles</u>					
M132A1 Flamethrower		-1			
4. <u>Combat Service Support Vehicles</u>					
M577A1 Command Post Carrier	+1			+3	
M548 Tracked Cargo Carrier			+1	+3	
XM45E1 Flame Service Unit		+1			+2
M54 5-Ton Cargo Truck				-3	-4
M35 2 1/2-Ton Cargo Truck			+1		
M49C Fuel Truck					+1
M50C Water Truck		+1		+1	+1
M37 3/4-Ton Cargo Truck	+1	+1		+1	+1
M151 Utility Vehicle	-1			-3	-3
5. <u>Weapons</u>					
Automatic Grenade Launcher, 40mm				+2	+11
M113A1 Armament Subsystem "A"	+5	+3			+2
XM-191 Multi-shot Portable Flame Weapon				+2	+11
M9-7 Portable Flamethrower					-9

FIGURE M-1 Total Resource Change Requirements by Type of Unit (U).

M-2

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RESOURCE	APPLICABLE UNITS				
	ACR	DIV CAV SQDN	SEP CAV TRP	TANK BN	MECH BN
6. <u>Communications</u>					
a. <u>Radio Sets</u>					
AN/VRC-12	-16	-13	-4	-11	-1
AN/VRC-46	+26	+20	+7	+18	+24
AN/VRC-47	+2	+2	+1		-16
AN/VRC-49	+1	+1		+1	+1
AN/VRC-53/64	+1	+1			
AN/VRC-125/160	+13	+9	+3	+9	+11
AN/PRC-25/77	+23	+20	+6	+24	+36
AN/PRC-88					-54
AN/GRC-106	-1			-1	-1
AN/VRC-24	-1			-1	-1
b. <u>Accessories</u>					
RC-292 Antenna					+6
AB-577 Antenna Base	+2	+2		+2	+2
Rectifier, PP1104G	+3	+3	+1	+1	+3
c. <u>Speech Secure</u>					
TSEC/KY-8/38	+38	+26	+4	+34	+37
7. <u>Other</u>					
Searchlight, AN/VSS-3					+11
Handheld Mine Detectors	+27	+31	+7	+5	
IR Weapons Sight		-128		-79	-102

FIGURE M-1 (C). Cont'd

M-3

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RESOURCE	APPLICABLE UNITS				
	ACR	DIV CAV SQDN	SEP CAV TRP	TANK BN	MECH BN
M34/36 IR, Tank Cmdr's Sight	-54			-54	
Metascope, AN/PAS-6	-47	-40	-13	-19	-34
Starlight Scope, AN/PVS-1/2/3				+42	+59
Night Vision Sight, AN/TVS-2	+2	+118		+82	+13
Night Observation Device, AN/TVS-4	-5	-6		-2	-5
Trailer, Water, 400-Gallon			+1	+5	+5
Tank and Pump Unit					-4
Tank, 600-Gallon					-4
Drum and Pump Unit			+1	+2	+2
Drum, 500-Gallon			+3		
Drum, 250-Gallon				-5	-7
Transfer Pump, POL	+6	+5	+1	+6	+6
Chainsaw	+14	+10	+2		
Tool Set, Nr 1, Common			-1		
Tool Set, Nr 2, Common			+1		
Steam Cleaning Apparatus	+1	+1	+1	+1	+1

FIGURE M-1 (C). cont'd

M-4

# CONFIDENTIAL

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RECOMMENDATION	APPLICABLE UNITS				
	ACR	DIV CAV SQDN	SEP CAV TRP	TANK BN	MECH BN
1. A surveillance and target acquisition platoon be added to each armored and mechanized battalion/squadron. (Recommendation 1)	X	X		X	X
2. The basis of issue of AN/VSS-1/2 and AN/VSS-3 searchlights be standardized by MTOE/TOE line item or vehicle BII at one per M48A3 and M551, respectively. (Recommendation 3)	X	X	X	X	
3. Mechanized infantry units be authorized one searchlight per rifle platoon/scout section. The searchlight should be rugged, light, stowable inside the vehicle, and provide white and pink-light illumination. (Recommendation 5)					X
4. The tank commander's cupola-mounted optical machinegun sights be deleted from M48A3 tanks in RVN. (Recommendation 7)	X			X	
5. Armored and mechanized units be authorized the quantities of passive night vision devices indicated in Figure IV-2. (Recommendation 9)	X	X	X	X	X
6. The IR individual weapons sights and metascope of all armored and mechanized units in RVN be deleted from MTOE, turned in, and retrograded. (Recommendation 11)		X		X	X
7. Units be issued authorized quantities of the AN/PPS-5 radar. (Recommendation 12)	X	X	X	X	X

FIGURE M-2(C). Recommendations Pertaining to Intelligence (U).

M-5

# CONFIDENTIAL

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RECOMMENDATION	APPLICABLE UNITS				
	ACR	DIV CAV SQDN	SEP CAV TRP	TANK BN	MECH BN
1. Increase the BOI for handheld portable mine detectors to (Recommendation 20):					
a. Three per cavalry squadron HMT.	X	X			
b. Three per cavalry platoon and one per troop Hq.	X	X	X		
c. One per tank platoon.	X			X	
d. One per tank and scout section in the tank battalion HHC.				X	
e. Two per tank company Hq in the ACR.	X				
2. Two AVLBs be retained in each tank battalion; two AVLBs be provided each M48A3-equipped divisional cavalry squadron. (Recommendation 27)		X		X	
3. Regimental and divisional cavalry squadron medical platoons be issued one additional M113A1 medical evacuation vehicle. (Recommendation 29)	X	X			
4. ACR squadron howitzer batteries be authorized a suitably equipped M113A1 APC/ACAV. The presently authorized M151 1/4-ton truck be deleted. (Recommendation 30)	X				
5. Two M113A1s be deleted from the ground surveillance section of the tank battalion. [Paragraph III-2c(1)]				X	
6. One M548 cargo carrier or one M35 cargo truck be added to the troop headquarters. [Paragraph 2d(2), Annex I]			X		

FIGURE M-3(C). Recommendations Pertaining to Mobility (U).

M-6

# CONFIDENTIAL

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RECOMMENDATION	APPLICABLE UNITS				
	ACR	DIV CAV SQDN	SEP CAV TRP	TANK BN	MECH BN
1. Each M577A1 command post carrier be equipped with one M60 7.62 machinegun with rear mount and ballistic shield from the M113A1 Armament Subsystem "A". (Recommendation 31)	X	X	X	X	X
2. One caliber .50 machinegun on one vehicle in each mechanized rifle platoon and each scout section of the mechanized infantry and tank battalions be replaced by a 40mm high-velocity grenade launcher. (Recommendation 32)				X	X
3. All M113A1 medical evacuation vehicles in battalion/squadron medical platoons be equipped with Armament Subsystem "A". (Recommendation 33)	X	X		X	X
4. The authorized caliber .50 M2 machinegun and ringmount be replaced with an M60 machinegun and pedestal on all wheeled supply vehicles. (Recommendation 34)	X	X	X	X	X
5. The authorized BII caliber .50 M2 machinegun and mount kit be replaced with the M60 machinegun and mount kit for the M548 tracked cargo vehicle. (Recommendation 35)	X	X	X	X	X
6. The M2, HB, flex, caliber .50 machinegun BII be authorized on all M48A3 tanks in lieu of the M2, HB, electric, caliber .50 machinegun. (Recommendation 36)	X			X	
7. Each M48A3/M551 crew be authorized one M79 grenade launcher, three 5.56mm submachineguns (or three M16 rifles until a 5.56mm submachinegun is type-classified standard A), and one caliber .45 pistol. (Recommendation 38)	X	X	X	X	
8. Action be taken to expedite issue of the M125A1 mortar carrier to all units authorized this carrier. (Recommendation 40)	X	X	X		X
9. Nine M9-7 portable flamethrowers be deleted from the mechanized infantry battalion MTOE. (Recommendation 42)					X

FIGURE M-4(C). Recommendations Pertaining to Firepower (U).

M-7

# CONFIDENTIAL

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RECOMMENDATION	APPLICABLE UNITS				
	ACR	DIV	SEP	TANK	MECH
		CAV	CAV	BN	BN
	SQDN	TRP			
10. Launcher, Rocket: 66mm, 4-tube, XM202 be authorized on the basis of one per scout section in the tank and mechanized infantry battalions and one per mechanized infantry platoon. (Recommendation 43)				X	X

FIGURE M-4(C). Cont'd

M-8

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RECOMMENDATION	APPLICABLE UNITS				
	ACR	DIV CAV BQDN	SEP CAV TRP	TANK BN	MECH BN
1. The regimental FSCE be enlarged to a 14-man element with supporting equipment as requested by USARV; MTOE 17-52G, PO2 (2/70). [Recommendation 44a(1)]	X				
2. An organic support squadron, patterned after the support battalion of the separate armored brigade (TOE 29-75G), be authorized. [Recommendation 44a(2)]	X				
3. Each regimental cavalry squadron be authorized an artillery liaison element consisting of one captain (MOS 1193) artillery liaison officer; one E6 (MOS 13E40) artillery liaison sergeant; and two E4 (MOS 13E20) artillery liaison specialists/radio operators. [Recommendation 44a(3)]	X				
4. Each regimental cavalry squadron howitzer battery be authorized a fourth FO team. [Recommendation 44a(4)]	X				
5. HHC and Company D be reorganized to more efficiently realign combat support and combat service support functions as shown in Figures IV-3 thru IV-6. [Recommendation 44b(1)]				X	X
6. Reorganize Company D as follows: [Paragraph III-5a(5)]				X	X
a. Reconfigure the headquarters section similar to that of the mechanized rifle company, less one M113A1 communications vehicle, but with the addition of one 1/4-ton truck mounting an AN/VRC-47 radio.					
b. Reconfigure the maintenance section identical to that of the mechanized rifle company, TOE 7-47G, 12 September 1969.					

FIGURE M-5(C). Recommendations Pertaining to Command and Control (U).

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RECOMMENDATION	APPLICABLE UNITS				
	ACR	DIV CAV SQDN	SEP CAV TRP	TANK BN	MECH BN
7. Reassign HHC maintenance personnel, less three general-vehicle mechanics (E4, MOS 63C20) and one mechanic's helper (E3, MOS 63A10), and equipment to the battalion maintenance section. [Paragraph III-5a(5)]				X	
8. Delete the HHC maintenance section. [Paragraph III-5a(5)]					X
9. A study be conducted to determine the desirability and feasibility of modifying the organization of the tank battalion for employment in low-intensity stability operations by: [Recommendation 44b(2)]				X	
a. Adding a mechanized rifle company to the battalion.					
b. Replacing a tank platoon with a mechanized infantry platoon in the tank company.					
10. A fourth mechanized infantry company be added to the mechanized infantry battalion. [Recommendation 44b(3)]					X
11. Current doctrine regarding relationship of artillery forward observers operating with tank companies be reexamined. [Recommendation 44c(1)]	X			X	
12. Each tank company be provided with an 11-man rifle squad equipped with an M13A1 mounting one AN/VRC-47 radio and one AN/PRC-77 radio. [Recommendation 44c(2)]	X			X	
13. Each tank company be authorized a CP section consisting of one E5 senior radio operator (MOS 05C40), two E4 radio operators (MOS 05C20) and one E4 armored-vehicle driver (MOS 11E20) and equipped with an M577A1 command post carrier mounting one AN/VRC-12 and one AN/VRC-46 radio. [Recommendation 44c(3)]	X			X	

FIGURE M-5(C). Cont'd

M-10

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RECOMMENDATION	APPLICABLE UNITS				
	ACR	DIV CAV SQDN	SEP CAV TRP	TANK BN	MECH BN
14. Each battalion/squadron headquarters be authorized an S5 section consisting of an E6 civil affairs NCO, an E4 clerk typist, an E4 driver, a 3/4-ton truck, and one AN/VRC-47 radio. (Recommendation 45)	X	X		X	X
15. One NCO and two radio operators be added to the S3 section. (Recommendation 46)	X	X		X	X
16. Further study be made to determine communications requirements for armored and mechanized units in stability operations. (Recommendation 47)	X	X	X	X	X
17. Two AN/VRC-46 radios be authorized for all battalion, squadron, company, and troop commanders for use on their command tracked vehicles. (Recommendation 48a)	X	X	X	X	X
18. AN/VRC-46 radios be authorized as follows: [Paragraph III-5c(1)]					
a. Three per infantry company/cavalry troop command vehicle, including one for use by the attached FO	X	X	X		X
b. Two per rifle company headquarters M113A1 APC/ACAV					X
c. One per M577A1			X		
d. One per M132A1 mechanized flamethrower. X	X				
19. Delete the following authorizations for AN/VRC-12/47 radios: [Paragraph III-5c(1)]					
a. In command vehicles (M48A3/M113A1) at battalion/squadron, maneuver company/troop, and line/scout platoon level	X	X	X	X	X
b. In each scout platoon sergeant's M113A1	X	X	X	X	X

FIGURE M-5(C). Cont'd

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RECOMMENDATION	APPLICABLE UNITS				
	ACR	DIV CAV SQDN	SEP CAV TRP	TANK BN	MECH BN
c. In each rifle company headquarters M113A1 APC/ACAV					X
d. In the heavy mortar platoon FDC.				X	X
20. One each AN/VRC-46 and AN/GRC-160 radio be authorized for all platoon leaders' and scout platoon sergeants' command tracked vehicles. (Recommendation 48b)	X	X	X	X	X
21. Each armored and mechanized battalion/squadron be authorized one AN/VRC-49, one AN/VRC-47, and two AN/PRC-77 radios for use by attached artillery liaison sections. (Recommendation 48c)	X	X		X	X
22. One AN/VRC-47 radio be added to the troop headquarters for CP use. [Paragraph 2b(1)(b), Annex I]			X		
23. One additional AN/PRC-25/77 radio be authorized for each scout squad of the tank and mechanized infantry battalion scout platoon and for the scout squads of all cavalry platoons. (Recommendation 48d)	X	X	X	X	X
24. Four AN/PRC-25/77 radios be added to the transportation section of each battalion/squadron support platoon. (Recommendation 48e)	X	X		X	X
25. Authorize AN/PRC-25/77 radios as follows: [Paragraph III-5c(2)(c)]					
a. Two per tank company headquarters				X	
b. One per tank platoon				X	
c. Four per mechanized infantry platoon					X

FIGURE M-5(C). Cont'd

M-12

# CONFIDENTIAL

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RECOMMENDATION	APPLICABLE UNITS				
	ACR	DIV CAV SQDN	SEP CAV TRP	TANK BN	MECH BN
26. The AN/PRC-88 radio be deleted from the mechanized infantry MTOE. (Recommendation 48f)					X
27. Add one AN/VRC-44 radio to the heavy-mortar platoon FDC. [Paragraph 3k(2)(e), Annex J; Paragraph 3i(2)(j), Annex K]				X	X
28. One AN/VRC-53 radio be authorized for each M109 SP 155mm howitzer in the howitzer battery. [Paragraph 2g(2)(b), Annex G]	X				
29. Efforts be continued to develop a simple, rugged, durable, and reliable squad radio. (Recommendation 49)					X
30. Secure speech devices be authorized to all armored and mechanized units in two increments: (Recommendation 50)	X	X	X	X	X
a. Provide battalion/squadron command, artillery control, and administrative/logistical nets with a secure capability.					
b. When secure equipment has been qualitatively improved, extend secure capability to include company/troop command nets.					
31. The authorization for PP1104G rectifiers be increased to the following totals: (Recommendation 51)					
a. Tank battalions, cavalry squadrons and mechanized infantry battalions - three each (one, forward TOC; one, communications platoon; one, rear CP)	X	X		X	X
b. Separate cavalry troop, one each.			X		

FIGURE M-5(C). Cont'd

M-13

# CONFIDENTIAL

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RECOMMENDATION	APPLICABLE UNIT				
	ACP	DIV CAV SQDN	SEP CAV TRP	TANK BN	MECH BN
32. The authorization for RC-292 antennas in the mechanized infantry battalion be increased by six (for a total of 19); one additional to each rifle company and three additional to the battalion headquarters section. (Recommendation 53)					X
33. Each armored battalion/squadron headquarters be authorized two AB-577 antenna bases. (Recommendation 53)	X	X		X	X
34. Each combat and combat support vehicle be authorized one H-189/GR handset, one LS-454/U loudspeaker, and two headsets. (Recommendation 54)	X	X	X	X	X
35. The communications equipment repair system be modified as follows: (Recommendation 55)	X	X		X	X
a. Units be authorized a 5-percent DX float of radios.					
b. Forward communications maintenance capabilities be improved by permitting performance of higher skill-level repairs at battalion/squadron level and providing more responsive contact support at brigade level.					
c. Steps be taken to insure that the authorized DS-maintenance DX radios are maintained and utilized as intended.					
36. In all armored and mechanized units, the authorized grade of battalion/squadron communications chiefs be increased to SFC E7, and company/troop communications chiefs to SSG, E6. (Recommendation 56)	X	X	X	X	X
37. The AN and RTT equipment be deleted from each type of armored and mechanized unit in RVN. (See Annex P for detailed list.) (Recommendation 57)	X	X	X	X	X

FIGURE M-5(C). Cont'd

M-14

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RECOMMENDATION	APPLICABLE UNITS				
	ACR	DIV CAV SQDN	SEP CAV TRP	TANK BN	MECH BN
38. Two motor messengers/wiremen (MOS 36K20) be deleted from the battalion/squadron communications platoon in the tank and mechanized infantry battalions and regimental/divisional cavalry squadrons, and two field radio repairmen (MOS 36B20) added. (Recommendation 59)	X	X		X	X
39. The number of helicopters authorized the brigade aviation section be increased sufficiently to provide a dedicated command and control helicopter to each armored or mechanized battalion/squadron. (Recommendation 60)		X		X	X
40. The Air Control Team and all related equipment be deleted from the tank and mechanized infantry battalion and regimental cavalry squadron MTOFs. (Recommendation 61)	X			X	X
41. An aviator's distress-light marker (SDU-5/E) be added to the BII of all combat and combat support vehicles. (Recommendation 62)	X	X	X	X	X
42. Delete three battalion heavy mortar platoon forward observer teams. [Paragraph 2c(2)(b)2c, Annex J; Paragraph 2c(2)(b)2d, Annex K]				X	X

FIGURE M-5(C). Cont'd

M-15

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RECOMMENDATION	APPLICABLE UNITS				
	ACR	DIV CAV SQDN	SEP CAV TRP	TANK BN	MECH BN
1. Increased command emphasis be placed upon improving command relationships and more closely defining responsibilities between supported and supporting units with regard to automotive maintenance for armored and mechanized units. (Recommendation 65)	X	X	X	X	X
2. Divisional maintenance and area support DS maintenance battalions be structured to have the capability of providing each armored and mechanized battalion/squadron with a full-time maintenance contact team when locations, equipment density, or peculiar maintenance circumstances so dictate. (Recommendation 66)	X	X		X	X
3. MTOE authorizations for supervisory personnel be modified in each battalion/squadron transportation section to provide one NCO section leader (E7, MOS 64040) and two squad leaders (E6, MOS 64040), and to delete the authorization for a lieutenant, section leader, in the tank battalion and the armored cavalry squadron transportation sections. (Recommendation 69)	X	X		X	X
4. The supply section of each battalion/squadron be augmented with one E4, MOS 76Y20, general supply specialist and one E3, MOS 76A10, supply clerk. (Recommendation 69)	X	X		X	X
5. One E5, NCO (MOS 76Y40) assistant supply sergeant and two E4 (MOS 11D20) vehicle drivers be added to the separate cavalry troop headquarters. (Recommendation 70)			X		
6. An assistant squadron motor maintenance sergeant (E7, MOS 63C40) be authorized for the maintenance platoon of the regimental and divisional cavalry squadrons. (Recommendation 71)	X	X			
7. A materiel readiness NCO (E7, MOS 63C40) be authorized for each battalion/squadron headquarters section. (Recommendation 72)	X	X		X	X

Recommendations Pertaining to Support (U).

M-16

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RECOMMENDATION	APPLICABLE UNITS				
	ACR	DIV CAV SQDN	SEP CAV TRP	TANK BN	MECH BN
8. A maintenance data specialist (E4, MOS 71T20) be authorized for each company/troop/battery headquarters section. (Recommendation 73)	X	X	X	X	X
9. One clerk typist (E4, MOS 71B30) be added to the troop headquarters. [Paragraph 2d(4), Annex I]			X		
10. One assistant motor sergeant (E6, MOS 63C40), one welder (E4, MOS 44C20), one turret mechanic (E4, MOS 45G20), and one field radio mechanic (E4, MOS 31B20) be added to the troop maintenance section. [Paragraph 2d(3)(a)2]			X		
11. Personnel management agencies, at all levels, place increased emphasis on procedures that will properly assign personnel to duty positions consistent with their qualifications. (Recommendation 74)	X	X	X	X	X
12. Currently authorized M48A3 tank-mounted bulldozer blades be retained in tank companies, and command emphasis be placed on operator training in dozing techniques and prop-use of the tank-mounted dozer blade. (Recommendation 80)	X			X	
13. Two tracked flame service units (XM45E1 or a successor vehicle) be added to the mechanized infantry battalion and one to the divisional cavalry squadron. (Recommendation 87)		X			X
14. One M132A1 mechanized flamethrower be deleted from the divisional cavalry squadron. (Recommendation 82)		X			
15. Issue of authorized XM45E1 flame service units to all mechanized flame platoons/sections be expedited. (Recommendation 83)	X	X			X

FIGURE M-6(C). Cont'd

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RECOMMENDATION	APPLICABLE UNITS				
	ACR	DIV CAV SQDN	SEP CAV TRP	TANK BN	MECH BN
16. Authorizations for M548 cargo carriers and M54 5-ton cargo trucks be changed as follows: (Recommendation 85)					
a. Tank battalion - add three M548's; delete three M54's.				X	
b. Mechanized infantry battalion - add one M548; delete four M54's.					X
17. Each battalion, squadron, and separate troop be provided with steam-cleaning equipment. (Recommendation 86)	X	X	X	X	X
18. Recovery accessories be provided as indicated below: (Recommendation 87)	X	X	X	X	X
a. One 20-foot x 1-inch tow cable per each M113A1 and M551 vehicle.					
b. One 20-foot x 1 1/2-inch tow cable per M48A3.					
c. One 50-foot x 1-inch tow cable and one light tow bar per combat and combat support platoon or separate section of units equipped with M113 and M551 vehicles.					
d. One 50-foot x 1 1/2-inch tow cable and one heavy tow bar per M48A3-equipped platoon.					
19. Add one Number Two Common Tool Set and delete one Number One Common Tool Set from the Troop Maintenance Section [Paragraph 3k(7), Annex I].			X		
20. Armored and mechanized units be provided with one M50C 1200-gallon water tank and additional water trailers in the support platoon. (Recommendation 88)		X		X	X

FIGURE M-6(C). Cont'd

M-18

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RECOMMENDATION	APPLICABLE UNITS				
	ACR	DIV CAV SQDN	SEP CAV TRP	TANK BN	MECH BN
21. Adjust equipment authorizations as follows:					
a. Delete authorization for 250-gallon collapsible drums.				X	X
b. Add one 400-gallon water trailer to the troop headquarters.			X		
c. Add five 400-gallon water trailers to the support platoons.				X	X
22. Units be provided with the centrifugal pumping unit, 50 gpm, and accessories (components of the drum and pump unit) in accordance with the following BOI: (Recommendation 89)	X	X	X	X	X
a. One per mechanized rifle company, tank company, armored cavalry troop, and combat support company.					
b. Two per battalion/squadron support platoon.					
23. Adjust equipment authorizations as follows [Paragraph III-6d(7) and paragraph 31(2), Annex K]:					
a. Add one M49C fuel truck to the transportation section of the support platoon.					X
b. Delete four tank and pump units and four 600-gallon tanks from the transportation section of the support platoon.					X
c. Add two drum and pump units to the transportation section of the support platoon.				X	X
d. Add one drum and pump unit and three 500-gallon drums to the troop headquarters.			X		
24. Chainsaws be provided for armored cavalry units on the basis of one per troop or comparable-size unit and one in the support platoon. (Recommendation 90)	X	X	X		

FIGURE M-6(C). Cont'd

M-19

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RECOMMENDATION	APPLICABLE UNITS				
	ACR	DIV CAV SQDN	SEP CAV TRP	TANK BN	MECH BN
25. Errors in existing MTOE documents be corrected. (Recommendation 92)	X	X	X	X	X
26. Items of equipment listed in Appendix 3 to Annex C be deleted from existing MTOE. (Recommendation 93)	X	X	X	X	X

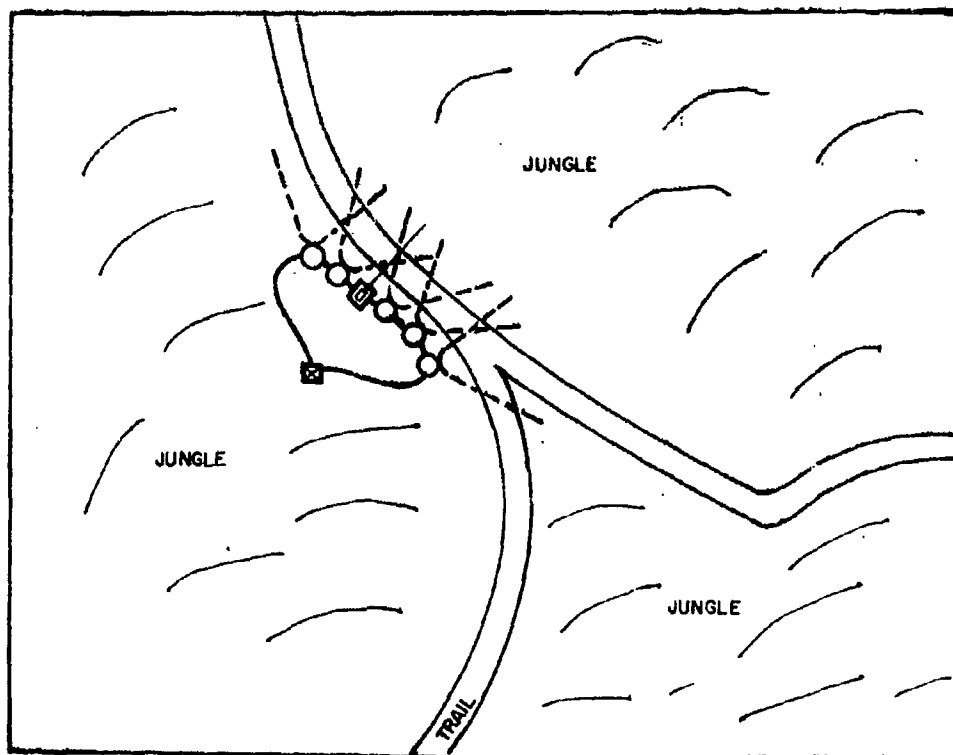
FIGURE M-6(C). Cont'd

M-20






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**SUPPLEMENTARY**

**INFORMATION**



**LEGEND:**

-  Claymore
-  Firing Device
-  Batteries
-  Trip Wire
-  Wire Circuit

**FIGURE K-8 (U). Typical Mechanical Ambush.**

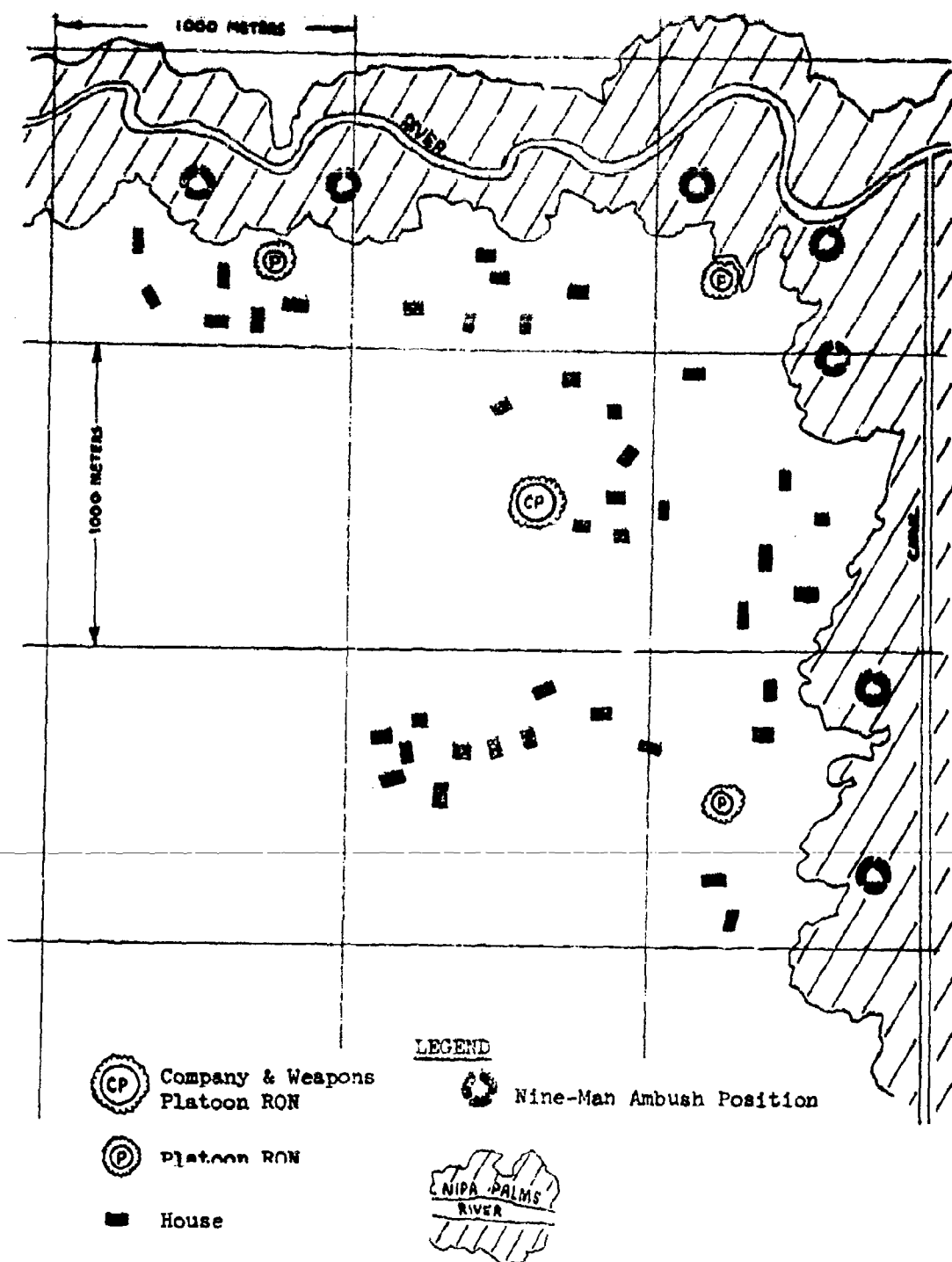


FIGURE K-9 (U). Typical Mechanized Rifle Company Night Ambush Operation in Populated Area.